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CREATING GREENWAYS

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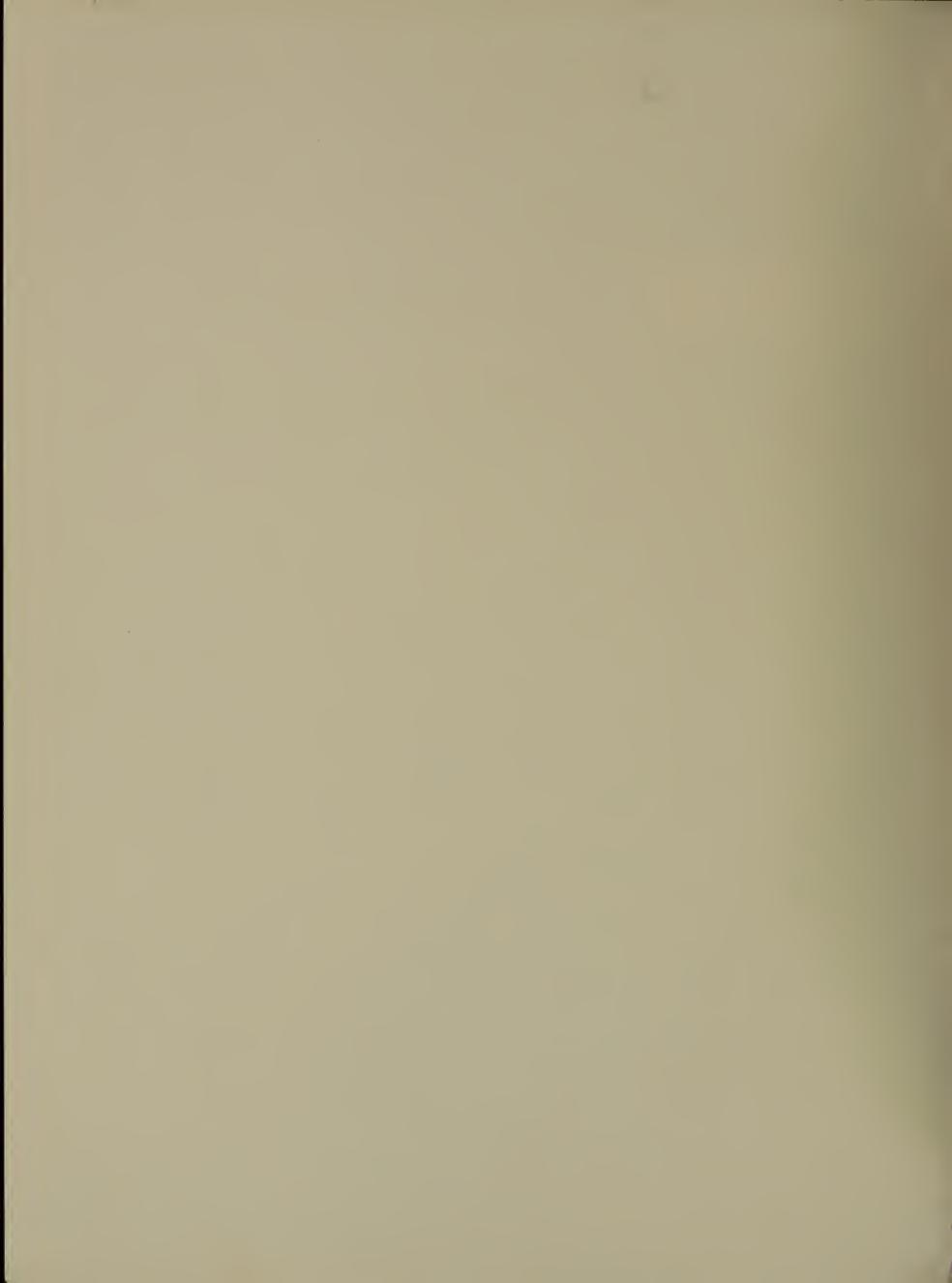
A Citizen's Guide



Commonwealth of Massachusetts

Department of Environmental Management Greenways Program





CREATING GREENWAYS

A Citizen's Guide

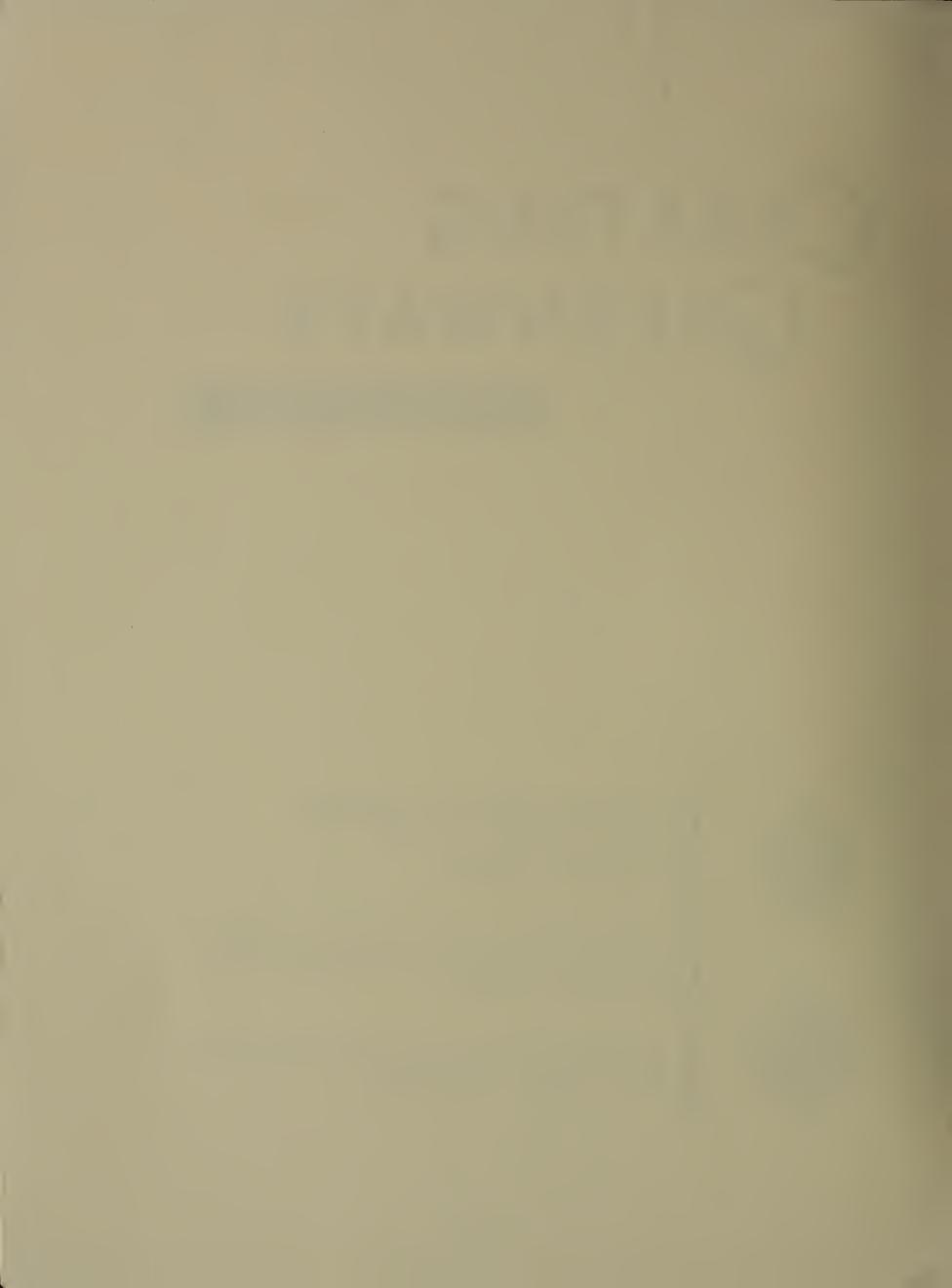




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—Jennifer Howard

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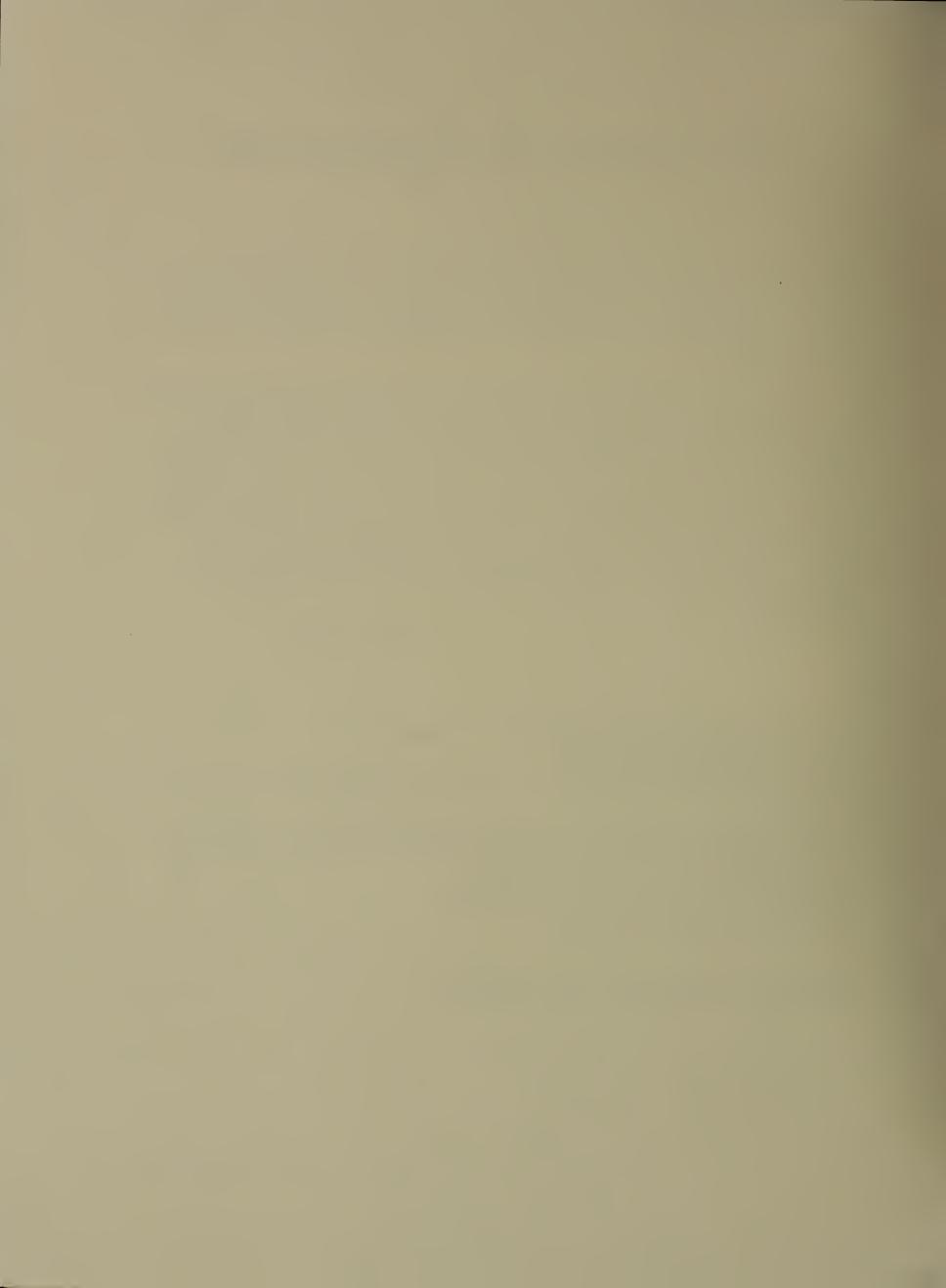
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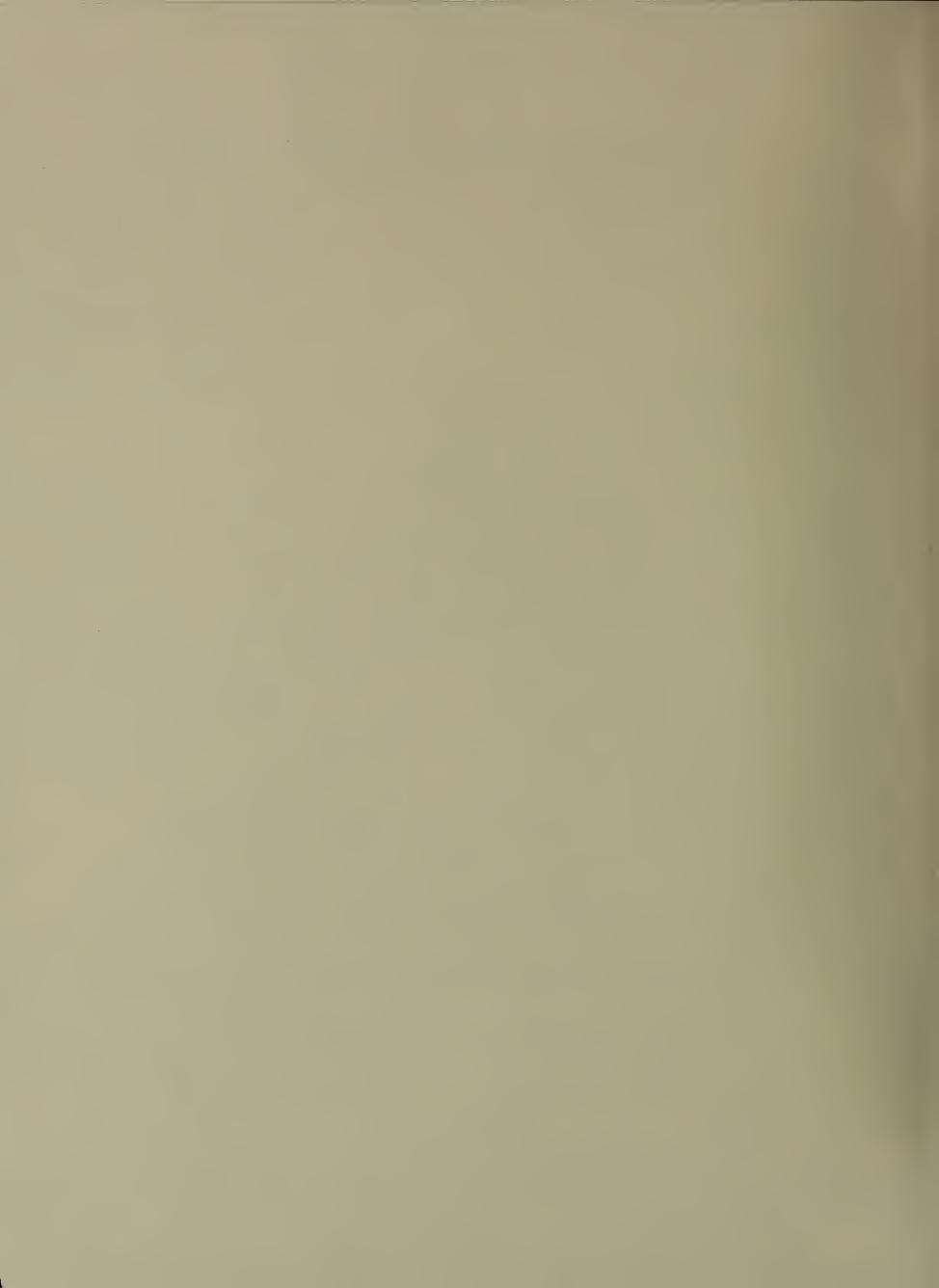
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Introduction

More than anything else, we found in Americans a love of the land, and a shared conviction that it is our legacy for the future...We found that recreation is important to people in their daily lives, and that most of them cannot imagine a world in which they did not have access to the outdoors.

—The President's Commission on Americans Outdoors



INTRODUCTION

Imagine the Massachusetts countryside laced with ribbons of green space threading together parks, natural resource areas, and important community features, or cities sprinkled with usable open spaces and trail networks, providing opportunities to enjoy the outdoors close to home. Now imagine that all of these "green corridors" were somehow linked together, creating a network of greenways, trails and protected open spaces throughout Massachusetts. This idea or "vision" is one that many of us are making a reality as we work to create greenways and trails in our communities. Today there are hundreds of greenway and trail efforts underway throughout Massachusetts.

Greenways are corridors of land and water that help protect a variety of unique resources, create many opportunities for enjoying and learning about the outdoors, and most importantly link these special places together. Creating greenways can satisfy a diverse set of environmental and social needs by connecting open areas, making them more accessible and interesting for people, or more life-sustaining for plants and wildlife, and by connecting people with nature and with each other. Greenways weave parks, cultural treasures, and natural places into our daily lives. Greenway advocates hope that these experiences will inspire us to create new greenways and trails, and expand this essential network of green for future generations.

HOW TO USE THIS GUIDEBOOK

This guidebook is intended to generate ideas and provide information to help interested citizens, civic organizations, government, and the business community work together to create greenways and trails across the Commonwealth. It is divided into three sections: Section 1 describes

greenways and their benefits and is intended to spark some interest in the greenway concept; Section 2 details the greenway planning and implementation process and provides general "how to" information about starting projects and seeing them through to completion; and Section 3 includes a series of appendices which list greenway related resource materials and references for obtaining more specific information and assistance.

For ease of presentation, the process of planning and implementing a greenway is described as a set of orderly phases. In practice, however, creating a greenway is not a step-by-step, linear process. For example, project publicity, fund-raising, and land protection activities will likely overlap, rather than occur sequentially, and it is important to keep this in mind when reading through the book.

The information presented is general, and should be tailored to meet the needs of specific projects. Throughout the book there are case studies, sample materials, and many photographs from real projects and places in Massachusetts, which show how some of the ideas and information presented actually work on the ground. If you have just heard about greenways, it may be helpful to read the entire book and decide which concepts are relevant to your effort, and which need to be adapted or reoriented. If you are involved in an ongoing project, it may be most useful to focus on those sections that relate to specific issues that your group is facing. Feel free to borrow ideas and copy materials from the book to inspire your colleagues, and to help make your greenway case to local and state officials, to your neighbors and to the public.

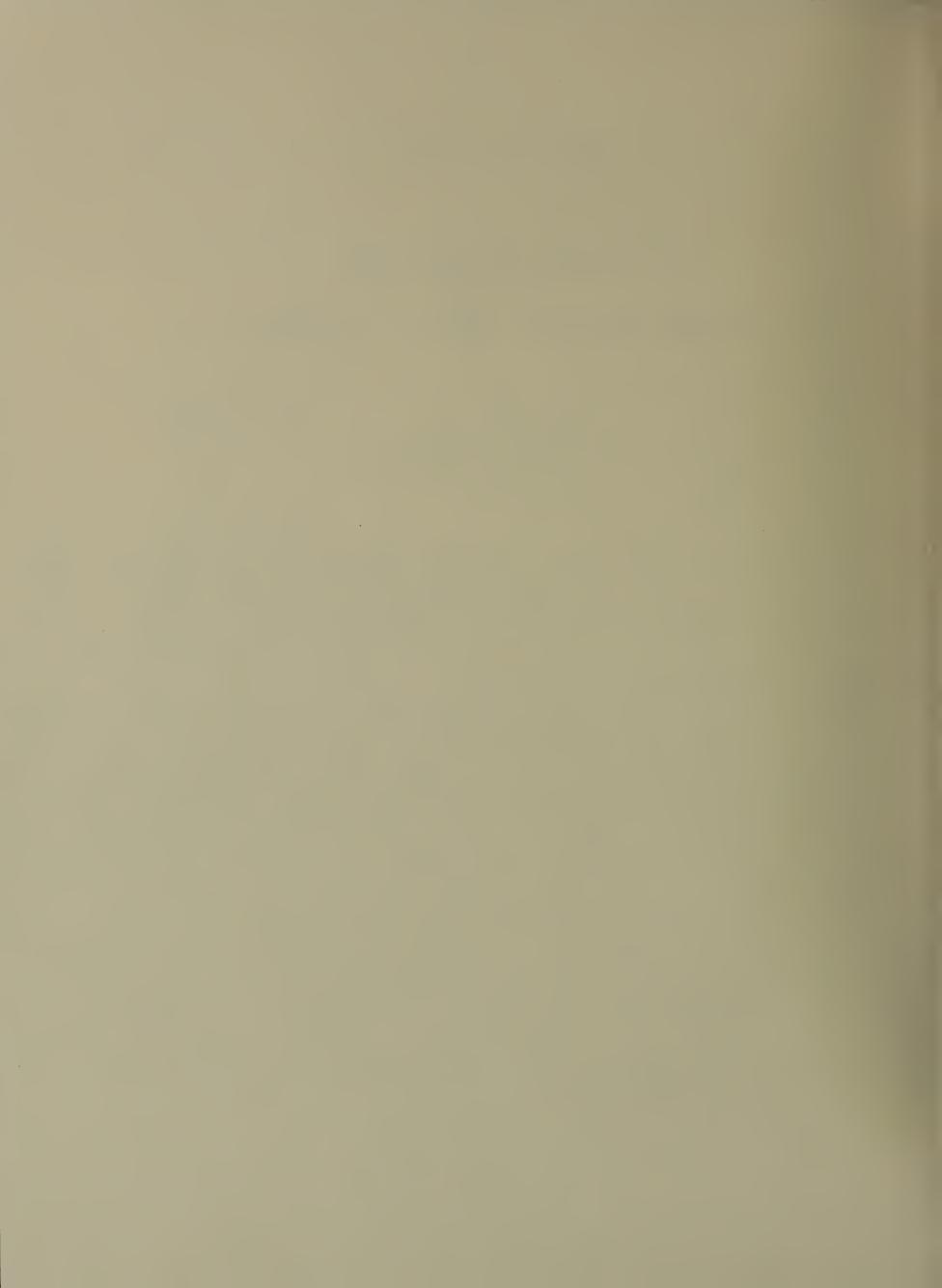
Happy Greenways & Trails!!

Section One

Greenways and their Benefits

Concern for the environment and access to parks and open space is not frivolous or peripheral; rather, it is central to the welfare of people body, mind, and spirit.

—Laurance S. Rockefeller



Chapter One

GREENWAYS



WHAT IS A GREENWAY?

A riverfront walkway, a bicycle path, an urban walking trail connecting historic sites and neighborhood parks, a wildlife migration corridor, and a series of open spaces joined by trails are all examples of greenways. By definition, greenways are corridors of land and water and the natural, cultural, and recreational resources they link together. They help conserve a variety of unique resources, create many types of recreational opportunities, and most importantly link these special

importantly, link these special areas together.

Greenways are comprised of both public and private lands, and can include trails, riverways, habitat and resource conservation areas, unique natural features, scenic roads, historic structures, vacant urban lands, forestland, and farm fields—basically any resource that is significant to a community. Some greenways focus on resource conservation through stream corridor protection. Others connect existing parks and open lands to increase recreational opportunities. Still others aim to promote revital-

ization of downtown sites by providing an inviting green corridor or pathway, making the area more appealing to businesses and residents alike. A greenway can be as simple as a foot trail connecting two neighborhood parks, or as complex as a multi-use urban recreational path that extends into the countryside through an intricate network of trails, old railroad grades, and local roads. While greenways may vary in size, ownership, and purpose, they share a common theme: to protect the resources that help create the unique



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Bicyclist at Riverside park in Maynard, along a section of the proposed Assabet River Rail Trail. When complete, the Rail Trail will link the towns of Marlborough, Hudson, Stow, Maynard, and Acton with a twelve-mile-long trail for commuting and recreation.

character of a place and to integrate these special features into the surrounding landscape. Winding their way through our cities, suburbs, and rural areas, these diverse corridors of green highlight our natural and cultural heritage, provide recreational opportunities close to home, and can help shape the future growth of our communities.

THE GREENWAY APPROACH TO OPEN SPACE PROTECTION

Whether you call them trails, linear parks, riverways, or wildlife corridors, it is the approach to creating and protecting these areas that defines them as greenways. Key to understanding the difference between greenways and other efforts at land protection is an appreciation of the fragmented nature of our landscape. In many communities, parks, wetlands, playgrounds and other open spaces are

scattered and, to many people, accessible only by car. The greenway concept is a response to this fragmentation and focuses on reconnecting our recreational and ecological resources. In simplest terms, while paths might wind around within a particular park, a greenway links this park together with other resources to create a coordinated and accessible system of open spaces and natural areas. These networks are not predetermined and superimposed on the landscape, but instead grow out of the natural and cultural features that already exist. The nature of a specific greenway project is determined when this concept of linking resources and protecting corridors of land and water is applied to a particular area, and the physical factors, political climate, available resources, and priorities and needs of those involved are considered. This process not only results in a logical, costeffective, and environmentally-sound development pattern, but it also brings together a variety of individuals as partners.

Greenways are often initiated and almost always implemented on the local or regional level. This grassroots approach results in greenway plans and projects that reflect local interests and needs, and thus are more likely to gain community support and acceptance. Local players have a detailed understanding of the physical and political landscape of their communities, and are the most logical ones to work with neighboring landowners and fellow community members. They are attuned to the strategies most likely to succeed and will be the most convincing advocates. And while the focus of individual greenway supporters may



Three young Berkshire residents sketch their ideas for a Housatonic River Greenway during a tri-town vision mapping session.

be town-specific, a strong local contingent can lay the groundwork for inter-town cooperation for protecting those resources that know no political boundaries. Citizens, town planners and other municipal officials, and local advocacy groups play a major role in determining the nature of particular greenway projects. Because of the variety of resources that can be incorporated into a greenway network, and the infinite possibilities for linking them together, specific greenway routes are often defined by the ideals of the project participants. While a major goal of the greenway approach is to link together landscape features, the creation of a greenway is also an extremely effective means of connecting people with the land, and with one another.

RESOURCE AREAS: THE BUILDING BLOCKS OF GREENWAYS

Many different types of land and water resources can be incorporated into a greenway system. They fall into four broad categories: resource conservation areas, parks and open spaces, cultural and historic resources, and the corridors of land and water which connect these other elements together.

Resource conservation areas, sometimes called preserves, encompass a variety of natural environments, including floodplains, wetlands, stream and river banks, coastal dunes, forests, and other environmentally-sensitive areas. Protecting these resources and keeping them in their natural state helps maintain the integrity of many ecological systems and ensures that they continue to function properly. While some of these areas are ideal for hiking, nature study, and outdoor appreciation, many are too fragile or simply not suitable for recreational activities. As a result, we may not have access to every inch of greenway created, but we do



Cedar Tree Neck, Martha's Vineyard.

benefit from the clean water, healthy populations of fish and wildlife, scenic pleasures, and natural setting that their protection provides.

PARKS AND OPEN SPACES

Parks are ideal spots for recreation and relaxation. A variety of public and private parks provide opportunities for swimming, boating, fishing, picnicking, golfing, walking, jogging, bicycling, rollerblading, playing ball, or simply sitting and enjoying the outdoors. Other open areas such as farm fields, estate lands, and golf courses are often privately owned and inaccessible to the public. Nonetheless, protection of these lands can play a key role in maintaining scenic views, local character, and the general open feeling of an area. They can also be used to link nearby protected areas, thereby increasing the amount of contiguous open space. This is often critical to the habitat requirements and migration patterns of wildlife. In addition, easements and public rights-of-way can sometimes be secured adjacent to or across private open lands, providing access to a relatively small strip of land, but enabling people to experience the entire landscape as they move through it.

Cultural and historic features reflect the diversity in history, settlement patterns, and character of the 351 cities and towns in Massachusetts. This group of resources includes any feature in a town or region that has special meaning or plays a role in defining the character or charm of that place. They range from old mills and historic buildings to churches and cemeteries to town commons lined with

These types of areas often face the greatest degree of threat, but also present the greatest opportunity.

two-hundred-year-old sugar maple trees. By recognizing and protecting these resources, we are preserving our heritage and highlighting the features that tell a community's story. Not only does this teach us about our past, but it also ensures that the unique and diverse characteristics of the Commonwealth continue to exist for generations to come.

CORRIDORS

Corridors are the stretches of land and water that link the various resources to create greenway networks. They are usually linear in nature and can be natural, human-made, or a combination of both. Some examples include river and stream channels, coastlines, canal towpaths, railroad and utility rights-of-way, paths and trails, scenic roads, and city sidewalks. These linear resources and their inherent potential for linkage characterize the greenway approach and set it apart from other open space protection initiatives. By joining different resources together into an integrated

network, each individual resource area becomes part of a greater whole whose utility, accessibility, and environmental value are far greater than any of the separate pieces.

The four types of resources discussed above may be under public or private ownership and can vary greatly in terms of the level of protection enjoyed and the type and extent of public access permitted or desired. Public and quasi-public conservation land is generally protected to some degree and tends to provide some level of public access and use. Examples of this type of land include public and private parks and conservation lands, nature centers, college campuses, municipal golf courses, certain land trust holdings, and waterways. It is likely, however, that many other resources and parcels of land that would be ideal for inclusion in your greenway network are not protected at all. Typical examples include farms fields, scenic vistas, undesignated historic structures, waterfront and roadside properties, and tracts of undeveloped land. These types of areas often face the greatest degree of threat, but also present the greatest opportunity. By working to protect these resources and to incorporate them into your greenway, you can have a positive impact on the environmental quality, visual beauty, and future character of your town or region.

TYPES OF GREENWAYS

All greenways link together resources, but the specific elements included and the way in which they are connected will vary depending on the goals, objectives, and feasibility of your particular project. For example, if the primary goal is to provide recreational opportunities, the swath of land chosen may be quite different than if the intent is to create a wildlife corridor. Both might include open fields, wooded trails, and land adjacent to rivers. However, the linkage patterns, types of infrastructure needed, acceptable levels of

human access, and permitted uses would vary greatly, influencing the location as well as the character of the corridor.

While greenways may be as diverse as the resources they protect, most projects fall within four broad categories: river greenways, paths and trails, cultural and historic greenways, and wildlife corridors. A brief description of each is given below. It is important to keep in mind, however, that greenway efforts rarely fit neatly into one category. Most greenways combine elements from one or more categories, ultimately satisfying a variety of goals.

RIVER GREENWAYS

Some of the most popular greenways in the country are those following rivers. The natural appeal of water, the abundance of resources and recreational opportunities in and around river corridors, and the linear nature of waterways are among the reasons so many greenway efforts focus on rivers and streams. A river greenway typically includes the actual river or stream channel plus a corridor of protected land on either side of the waterway. The width of this corridor is defined by a number of factors including natural features and envi-

including natural features and environmental constraints, local setback requirements, ownership patterns, and human-made barriers such as railroad tracks, canal towpaths, or existing buildings. River greenways also vary greatly in length; some focus on a particular stretch of water, while others attempt to encompass the entire river corridor.

Rivers have played a key role in the economic development and success of many communities across the Commonwealth. At the same time, they are essential to the life cycles of many plants and animals, and play a critical role in

maintaining clean water supplies and the delicate balance that exists at the water's edge. Creating a system of greenways that incorporates these waterways and the resources that surround them can at once protect the natural environment, rehabilitate historic landmarks, provide various outdoor opportunities, promote economic activity, and enable citizens to safely enjoy and experience our natural and cultural heritage.

River greenways are often grouped into two basic types: *urban river greenways* and *natural river greenways*. Although both address water quality and pollution control issues, many urban river greenways focus on recreation and are seen as a means to help stimulate economic activity and downtown revitalization. In contrast, the primary goal of most natural river greenways is to maintain the natural state of the river corridor.

Urban River Greenways

Rivers played a central role in the industrial revolution and were critical to transportation, communication, and economic growth. As a result, they became the backbone linking together the many cities and towns that devel-



ichard Paslev © 1

The Cambridge River Festival annually attracts crowds of over 100,000 to the banks of the Charles River in Cambridge and Boston.

INTRODUCING THE CONNECTICUT RIVER GREENWAY STATE PARK

ne of the newest and arguably most unique additions to the Massachusetts State Park system is the Connecticut River Greenway State Park. The park knits together recently acquired open space lands with existing DEM facilities near the river. The result is a new management unit which includes approximately 4,000 acres of land owned or controlled by DEM along the seventymile-long stretch of the Connecticut River that flows through Massachusetts. Much of the land within the greenway corridor is in private ownership and is part of the "working landscape" of productive farms and woodlots vital to the scenic quality, unique character, and economy of the Connecticut River Valley.

The park is part of a primary north-south greenway linking open space, parks, nature reserves,

scenic vistas, cultural features, and archeological and historic sites along the river to one another and to nearby cities and towns. Forming the backbone of this new

unit is the Connecticut River, a major migration route for waterfowl, sonabirds, and anadromous fish such as Atlantic salmon and American shad. Historically, the river also served as a transportation route for fur traders and

native Americans who moved up and down the river with the seasons as it provided food and opportunities for buying, selling, and trading goods. In the late



Canoeists along the Connecticut River Water Trail, a part of the Connecticut River Greenway State Park and a good example of a natural river greenway. The "trail" is the river itself, and provides opportunities for quiet recreation and wildlife observation.

oped along them. But with the advent of trains and automobiles, many urban rivers were abandoned as a means of commerce or transportation and were used primarily as dumping grounds for human and industrial wastes. This gave rise to vacant, unkempt areas bordering many urban rivers, which were often as uninviting as the polluted waters that ran through them. Rather than being the focal point of a community, rivers began to divide cities and their inhabitants.

Over the past twenty years, much has been done to improve the water quality of many rivers in Massachusetts. Creating urban

river greenways can play a vital role in this trend and help restore rivers to a more positive cultural and economic status. Working to clean up a river and to create a riverfront pathway such as the Housatonic Riverwalk can have significant environmental, economic, and recreational benefits. An urban river greenway can also act as the spine of a larger greenway network; spin-offs connecting the waterfront with neighborhoods, shopping centers, and various historical sites and tourist attractions further increase its utility and economic benefit. In addition, a river greenway that begins in an urban area can

1800s and into the early 1900s, the river was used to float sawloas from the spruce forests up north to lumber mills downstream. During the era of industrial expansion, it became a depository for sewage and other waste materials. Thanks to many years of revitalization efforts, the Connecticut River has been largely cleaned up and is now an important ecological and recreational corridor. DEM's goal is to maintain the integrity of the natural areas, open farm fields, and woodlands which comprise the diverse landscape of the river valley. The new park provides protection for special resource areas, offers access points to the river, and contains recreational facilities for able-bodied and disabled citizens alike. It also creates an appropriate framework for management as new lands are brought under its stewardship, while respecting private property rights.

As part of the largest river greenway in New England, the Connecticut River Greenway State Park encompasses a number of

smaller greenways, including the Norwottuck Rail Trail, the Connecticut River Water Trail, the recently completed hiking connection between the river and Skinner State Park, and a "work in progress" trail from the river to Mt. Toby State Reservation. The Park provides a variety of opportunities for recreation and for appreciating the outdoors. You can ride a bicycle or rollerblade on a dedicated rail trail, enjoy birding and nature study in the best floodplain forest habitat in the region, picnic atop Mount Sugarloaf overlooking the Connecticut River, canoe, boat, or fish the river itself, hike the extensive trail system on Mt. Toby, or learn about the valley's natural and cultural history at the Great Falls Discovery Center in Turners Falls. Other areas within the park include Bashan Beach Recreation Area; Elwell Recreation Area (which includes a wheelchair-accessible dock and rowing program for disabled citizens); a 100-acre floodplain forest reserve containing unique habitats and river forma-

tions; a dinosaur fossil footprint site; six boat access sites from Chicopee to Northfield, and more than twelve miles of permanently protected Connecticut River shoreline, including nearly 1,100 acres of land under conservation restriction. Establishment of this greenway park also complements the goals of the U.S. Fish & Wildlife Service's (USFWS) Silvio O. Conte Wildlife Refuge project along the Connecticut River. Many of the sites secured by DEM match key areas identified by the USFWS.

A Connecticut River Advisory Council has been formed, made up of legislators and citizens representing a range of interests in resource protection and in the recreational use of the river and its environs. This group provides ongoing management recommendations to DEM regarding the Park. For more information on the Connecticut River Greenway State Park, contact the Park Supervisor at 136 Damon Road, Northampton, MA 01060; (413) 586-8706.

provide pedestrian or bicycle access to the natural environment as it travels out into the countryside. When complete, the Blackstone River Bikeway will run from downtown Worcester to Providence, Rhode Island, traveling through small towns and suburbs along the way. This major transportation and recreation corridor will be an asset to the region and has stimulated many smaller, local greenway and trail projects which are tied into the larger, long-term vision.

Natural River Greenways
Natural or "wild" river greenways provide
many of the same benefits as urban river

greenways, but usually differ in character from their urban counterparts. Resource protection and low-impact recreation are very often the primary goals of natural river greenways. Protecting natural river corridors helps to maintain water quality, is essential to the continued existence of many plant and animal species, minimizes flood damage and the associated costs, helps to prevent erosion, and provides many recreational opportunities such as nature study, hiking, canoeing, and fishing.

Monitoring adjacent land uses is also an important element in establishing a successful natural river greenway. Extensive agricul-

tural spraying, timber cutting, earth removal, lawn care applications, and/or paving can lead to increased run-off, water pollution, and erosion of the streambanks. In addition, proper management of adjacent land helps protect the scenic beauty of the riverbanks, enhancing the experiences of those hiking, swimming, canoeing, kayaking, or fishing.

PATHS AND TRAILS

Like river greenways, trail-based greenways are diverse and can take numerous forms on the ground: walkways, hiking trails, bicycle paths, exercise trails, riverfront esplanades, and bridle paths. These provide for a variety of recreational opportunities including walking, hiking, skiing, nature interpretation, bicycling, roller-blading, and running. Because of the linear nature of trails and their ability to link resource areas, every type of greenway usually includes some type of trail. It is important to remember that the main purpose of most trail-oriented greenways is to provide people with recreational opportunities and easy access to the outdoors close to where they live. While creating trails and paths clearly has environmental and economic ben-



Hikers enjoy the Mill Brook Trail on Martha's Vineyard.

efits, recreation, access, and mobility are the prominent features of trail-based greenway systems. Paved and hard-surfaced pathways can also provide recreation and transportation opportunities for people in wheelchairs.

Most trail-oriented greenways, regardless of their specific character, connect a variety of open spaces, public places, and resource areas. However, some networks feature the trails themselves, such as the Metacomet—Monadnock, Midstate, and Appalachian trails, and bicycle pathways like the Norwottuck Rail Trail and the Minuteman Commuter Bikeway. Many bikeways and pathways are also used as an alternative to the automobile for commuting, shopping, and other local activities. In these cases, a separate bicycle lane is sometimes designated to help prevent conflicts among trail users.

Trail corridors can be assembled and acquired by state and federal agencies, municipalities, land trusts, or other private organizations, and are often established along easements donated or purchased from private land owners. Railroad and utility rights-of-way, although not originally intended for public recreational use, are often put to good use by greenway and trail planners. There are many such rail-trail efforts underway throughout Massachusetts. The Organization for the Assabet River, for example, is working to establish a twelve-mile-long pathway between Marlborough and South Acton using abandoned railroad rights-of-way and stretches of the Assabet River greenway.

CULTURAL AND HISTORIC GREENWAYS
The motivation behind this type of greenway
is to rehabilitate and conserve cultural and
historic resources, and to make them accessible to the public. Once identified, features
such as historic districts or individual structures, urban heritage parks, monuments, sites
of cultural interest, and museums can be integrated into a greenway system. Various com-



River Bend Farm in Uxbridge lies along the Blackstone River, a major transportation corridor of the early industrial period. Now a visitors center within DEM's Blackstone River and Canal Heritage State Park, River Bend Farm houses exhibits on the agricultural and industrial history of the area, and forms a key link in a regional greenway proposed for this historic corridor.

binations of walking routes, scenic roads, trails, and waterways can effectively weave together these often scattered resources into a logical network. The Ten Mile River Watershed Alliance is working with the City of Attleboro to establish a Heritage Trail network throughout the Ten Mile River watershed. The first phase of this project is to create three miles of walking trails within Attleboro which highlight and interpret historical and natural resources along the route.

Creating cultural/historic greenways often involves the rehabilitation of abandoned structures and the restoration of entire areas, both of which help to enhance the quality and character of a place. These types of improvements can also increase the property value of parcels within and adjacent to the greenway. In addition, cultural/historic greenways usually entail some interpretation of the featured

resources, serving to educate both residents and tourists alike.

The features included in cultural/historic greenways document our past, enrich our present, and highlight the unique character of cities and towns across the Commonwealth. Protecting these resources helps us to appreciate our heritage and enables us to share it with future citizens. Not only are these greenways attractive and educational, but they can also help to stimulate the economy, making Massachusetts a more appealing place to live, work, and visit.

WILDLIFE CORRIDORS

A wildlife corridor is a swath of protected land and/or water where animals can live and travel undisturbed by development and other human activity. Urbanization and unplanned growth have resulted in a fragmented development pattern. While the landscape may appear too developed to support many wildlife species, there is often more open space within developed areas than might be expected. The problem is that most of these parks and patches of green space are isolated and do not meet the habitat requirements of wildlife that require large protected territories, or the ability to move between two different habitats for breeding purposes. However, when these scattered areas become part of a connected network of protected natural areas, their utility and ability to support larger and more sensitive wildlife species often

increases. Protected corridors can also link together existing wildlife preserves, greatly enhancing the contiguous acreage of safe habitat on which many animals depend. Linking habitat areas to create safe migration routes is a key concept behind wildlife corridors.

Unlike most other greenways, wildlife corridors are rather specific and must be carefully tailored to the habitat and migration needs of particular species. The size of the swath, its location, and the permitted level of human access are determined by the requirements of the primary animal(s) targeted for protection. For example, river otter habitat requirements were selected as a criterion for determining the feasibility of a wildlife corridor between Quabbin Reservoir and Mount Wachusett in Worcester County. River otter require a corridor with a 300-foot buffer area, and a range of approximately fifteen to thirty linear miles.² It was found that a corridor this size could be assembled and designated within the suburban/rural environment under consideration, especially since river otter can tolerate a certain amount of human activity. The Florida panther, on the other hand, requires acres and acres of contiguous, undisturbed wilderness in order to survive.³ Creating a corridor to accommodate these needs would likely require designating large areas as wildlife preserves and connecting critical habitat areas to prevent further fragmentation by new roads and development of their already endangered habitat.

It is clear that we cannot stop development nor can we afford to purchase and set aside the large amount of land some species require. However, establishing wildlife-oriented greenways is a feasible alternative for protecting and expanding threatened habitat areas and for maintaining biological diversity in our ever-changing landscape.

THE GREENWAY MOVEMENT: BRINGING NEW LIFE TO AN OLD IDEA

reenways have become extremely popular in the past two decades, but they are by no means a new idea. A number of planners, landscape designers, projects, and books in both the United States and Europe have influenced open space initiatives and contributed to the modern greenway concept. In the late 1800s, well-known landscape architect Frederick Law Olmsted designed a number of urban park systems based on the premise that open space and recreation were essential components of urban life.4 He believed that in order for citizens to genuinely experience the outdoors, they needed to be able to move through it from one park or open space to another. It was this notion that gave rise to Olmsted's "parkways," which were scenic paths connecting urban parks. Unlike modern parkways built to accommodate fast-moving automobiles, Olmsted's parkways were designed to enable people, either on foot or in carriages, to experience the beauty of their surroundings as they traveled.⁵ These linear connectors were the forerunners of the linkage principle, one of the major components of the modern greenway concept.

One of Olmsted's most famous park and parkway systems was Boston's Emerald Necklace. Proposed in 1887, this four-and-one-half-mile-long arc of open space created a green strip connecting Boston Common with Franklin Park and including many accessible open areas along the way.⁶ The Emerald Necklace was the inspiration for the present-day Massachusetts Bay Circuit which, when complete, will form a diverse network of open spaces encircling the entire Boston Metropolitan area.

THE BAY CIRCUIT TRAIL & GREENWAY: BOSTON'S OUTER EMERALD NECKLACE

I magine a two-hundred-mile-long garland of green encircling metropolitan Boston, a continuous network of trails, waterways, parks, and other open space. An impossible dream? Not according to Alan French, Chairman of the Bay Circuit Alliance, a nonprofit corporation dedicated to making this vision a reality. With more than 145 miles of walkable trail already in place, only ten linkages remain to be secured before the Bay Circuit Trail forms a continuous 200mile-long corridor from Plum Island in Newburyport to Bay Farm in Duxbury.

The idea for a Bay Circuit greenbelt was first proposed in 1929 by a Governor's Committee on the Needs and Uses of Open Space. It recommended the formation of a connected ring of parks, forests, and reserves to provide present and future residents of the growing Boston metropolitan area ready access to the countryside. Central to this proposal, made well before the construction of Route 128, was the construction of a new parkway to serve as a recreational touring route. Cut short by repercussions from the stock market crash, the idea surfaced again in 1937 with The Trustees of Public Reservations, a quasi-public organization created by the legislature in 1891 "to acquire and hold for the public enjoyment, beautiful and historical places." The Trustees' 1937 plan was a call to action to make the Bay Circuit a reality. It recommended extending the Metropolitan Park System beyond the city center to the area now roughly contained between routes 128 and 495, and developing a Bay Circuit Parkway to meet increased demands for access to the country. Additional open spaces would be located within this 50-town corridor to form a linked system of reservations serving a wide variety

of conservation, recreation, and cultural needs.

Unfortunately this plan also failed to be implemented and it later languished while the country dealt with World War II and its aftermath. It appeared the plan might come alive once again in 1956 when Governor Christian Herter signed into law a program to link public and quasi-public open spaces along the proposed Bay Circuit route. The legislation, Chapter 631 of the Acts of 1956, established the Bay Circuit as a "system of privately and publicly owned open spaces, including

parks, forests, reservoirs, wildlife preserves, scenic and historic sites and other properties or reservations." It also mandated that, "in order to preserve said open spaces and make them available for the use, enjoyment, exercise and recreation of all people, said spaces shall be connected by a tourist route to be known as The Bay Circuit...." However, no funds were appropriated to support this legislation and the Bay Circuit initiative made little progress.

Over the next several decades metropolitan Boston experienced a period of rapid economic growth and landscape change. As new residential and commercial cen-



ters pushed outward to Route 128 and beyond, the land-use impacts became increasingly apparent: low-density residential sprawl, commercial strips, and the loss of open space. In recognition of this rapidly changing landscape, \$3.25 million for the Bay Circuit was included in a landmark 1984 bond authorization for environmental projects, with administrative responsibility of these funds assigned to the Department of Environmental Management (DEM).

DEM's first challenge was to solidify the Bay Circuit vision and to determine how to adapt a fifty-five-year-old concept to fit present trends, needs, and land uses. Given the extent of development and the loss of open space, it was doubtful whether it would even be possible for the Bay Circuit to be a broad system of connected parks as originally envisioned. Working in conjunction with a new advisory committee, the Governor's Committee on the Bay Circuit, DEM set objectives for the Bay Circuit program that were as close as was reasonable to the original concept.

From the start, the focus was on encouraging cooperative projects with communities within the proposed Bay Circuit corridor. This strategy sprung from the belief that local citizens have firsthand knowledge about what land would best be included in this greenway system, and the fact that much of the land protection and management would occur at the local level. DEM saw its role as presenting the vision of the Bay Circuit and providing regional coordination and technical assistance to communities. To this end, DEM established regional committees with two representatives from each community to communicate the

objectives of the Bay Circuit program and to enlist their help in gathering information, working with local boards, defining local needs and opportunities, etc.
Through these efforts DEM was able to identify the already-protected open space, which became the backbone of the Bay Circuit network.

Over the years, a fair amount of land within the Bay Circuit corridor had been protected by municipalities, state and federal agencies, and land trusts. However, these efforts were not well coordinated and the resulting protected lands were scattered throughout the proposed greenway and beyond. To address this situation and the obvious need for additional acquisitions to create a continuous Bay Circuit cor-

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ridor, DEM developed a set of criteria for evaluating potential acquisitions. Based on environmental, cultural, and scenic factors, these criteria put a high priority on linkage, the ability of a property to enhance the connectedness of the open space system, and on joint projects, those for which a municipality could find other sources of funding to help protect the property. In this way the Bay Circuit program used its

limited acquisition funds to encourage cities and tow st explore as many funding option as possible. These early efforts resulted in the acquisition of one large State Park and four smaller regional parks to be managed locally. To help communities study existing land uses, plan for future open space and recreational needs, and identify potential Bay Circuit routes, DEM developed a program of small planning grants. With this support, cities and towns produced a variety of planning studies, ranging from open space plans with a focus on establishing a Bay Circuit route, to river corridor and water supply protection plans, to a plan for a regional trail system. While DEM met with each community to encourage that Bay Circuit linkages be given priority for any open space protection initiatives, the most lasting legacy of the grants program was the number of local open space plans which continued to emphasize the Bay Circuit for years into the future.

When fiscal constraints threatened additional state support for the Bay Circuit initiative, DEM convened regional conservation and recreation groups to consider a new strategy for the Bay Circuit. At this meeting, the National Park Service's Rivers & Trails Program suggested a change in focus from broad planning initiatives to community trail-building, starting with an exploration of possible trail routes. The result: the first Bay Circuit Trek held in June 1990, during which participants hiked, biked, and canoed the entire corridor over the course of seven days. The Trek mobilized volunteers and professionals alike to informally organize the Bay Circuit Alliance as an umbrella coali-

tion to coordinate the location, protection, and dedication of trail segments, to provide assistance to local organizations, to raise funds, and to increase public awareness about the Bay Circuit initiative. The success of the first Trek also stimulated action on the Trail itself. On November 17, 1990, the first trail segment of 3.4 miles linking state forest and private conservation lands in Boxford was officially dedicated. Each year since then, additional sections of trail have been opened and there are currently more than 145 miles of trail in Bay Circuit communities available for public use. Directly or indirectly related to these trail openings, more than 600 acres of open space have been protected throughout the Bay Circuit Corridor.

In May 1992 the Bay Circuit
Alliance was formally incorporated as a private, non-profit corporation with the mission of working for "an accessible, permanent recreation trail corridor linking the parks and open spaces surrounding metropolitan Boston by the year 2000."

Today, thanks to the continuing efforts of the Alliance and its "partners," the Bay Circuit is alive and growing. In keeping with its mission, the Alliance brings together more than thirty-five public and private local, regional and statewide organizations to assist community trail planning, to work with state agencies, and to advocate for open space protection within the Bay Circuit



Hikers on Bay Circuit Trek, Callahan State Park.

greenway. In December 1995, the-Alliance published a Protection Plan for the Bay Circuit Trail and Greenway, which identifies and evaluates the importance of each of the remaining linkages required to complete the Trail. And in the future? The Alliance has initiated a second vital phase of protection planning, which concentrates on creating a wider corridor of protected open space and on enhancing the cultural and historical significance of the Bay Circuit Trail and Greenway. While these plans are essential to getting the job done, the Alliance continues to focus on converting plans into action at the local level, in order to establish the final linkages in time to greet the year 2000 with

a completed Bay Circuit
Trail.

Reflecting back nearly seventy years, one can only marvel at the visionary nature of the idea for a greenway corridor of connected open spaces and parks surrounding metropolitan Boston. The scenic parkway which was pivotal to the early proposals is now well on its way to becoming a two-hundredmile-long "scenic hike" accessible only to nonmotorized traffic. But the Bay Circuit is not only a wonderful recreational resource, it is a testament to the cooperative efforts of federal, state, local, and nonprofit organizations to transform this vision into reality.

This summary is based on The Bay Circuit, the 1937 plan by The Trustees of Public Reservations;

DEM's 1989 Report on the Bay Circuit; the Protection Plan for the Bay Circuit Trail and Greenway, Phase One: Completing the Trail, produced by the Bay Circuit Alliance, September 1995; the Bay Circuit Trail booklet produced by the National Park Service's Rivers & Trails Program; and comments from Susan Ziegler, former Bay Circuit Program Director for DEM, and Alan French, Chairman of the Bay Circuit Alliance.

For more information on the Bay Circuit Trail or on the efforts of the Bay Circuit Alliance, contact Alan French, Chairman, Bay Circuit Alliance, 3 Railroad Street, Andover, MA 01810; (978) 470-1982.



The dedication of the Discover Hamilton Trail brought together an enthusiastic group of supporters for this home-grown trail initiative developed by the town Conservation Commission. A pancake breakfast followed by guided walks along the entire trail introduced residents to this new town resource.

While Olmsted was creating and promoting the parkway concept in the United States, greenbelts were also gaining prominence in Britain. In the U.S., the term "greenbelt" is often used interchangeably with greenway to refer to any relatively wide swath of protected open space. In Britain, however, the term greenbelt usually describes the specific technique of encircling a growing urban area with a band of open space to contain metropolitan expansion, to prevent cities and towns from merging together, and to maintain large areas of open countryside amidst a developing landscape. Most contemporary greenways in the U.S. do not specifically focus on containment, although they do use open space to shape growth while providing access to the countryside. This characteristic of our modern greenways is based in part on the British greenbelt system.

In 1928, Benton MacKaye, a forester by training, spoke of the need to create "circuits

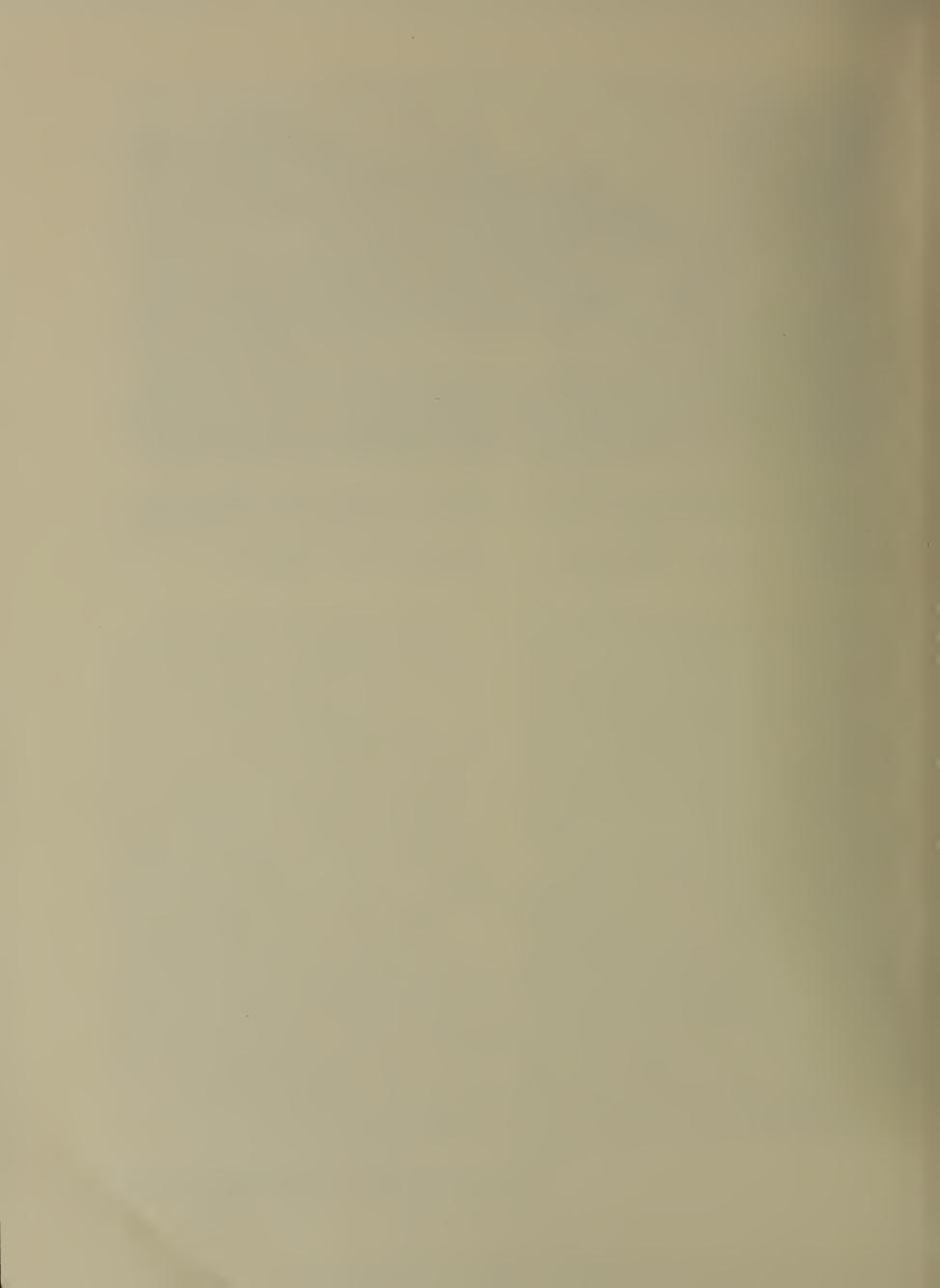
of open ways" to guide metropolitan development and to provide people with access to the natural environment. Known as the originator of the Appalachian Trail, MacKaye promoted creating large environmentally-based networks of open space. His ideas on regionalism and resource-based planning and design added significantly to the evolving greenway concept, and made him an important figure in the regional planning movement of the 1920s.

In his 1968 book on metropolitan open space, *The Last Landscape*, William Whyte speaks of the utility of linking open areas to create linear open space networks.⁸ A well-known landscape architect and urban planner, Whyte also played a large role in popularizing the term "greenway," although clearly he was neither the first nor the last to promote the idea.

In 1987, The President's Commission on Americans Outdoors brought national recognition to greenways and greenway planning by making it the centerpiece of their final report. It is not surprising that as metropolitan growth has continued to increase, so has the need for and thus the interest in greenways. In the Commission's summary report they recommended that "communities establish corridors of private and public recreation lands and waters, to provide people with access to open spaces close to where they live, and to link together the rural and urban spaces in the American landscape." This national support and publicity of the greenway vision validated the greenway movement and further increased its momentum.

The modern greenway concept has grown out of the challenges and successes experienced by some of the most creative and visionary planners of this century as they attempted to protect the aspects of the countryside they valued most. Today's greenway

movement is the result of hundreds of committed individuals who have updated these visions, and transformed them from ideas of the past to present-day realities. While discussions and articles about the greenway concept have been ongoing for more than a century, the popularity and success of greenway planning projects over the past two decades has been dramatic. Today, hundreds of greenway initiatives are underway throughout the United States, including a number of innovative efforts in Massachusetts. It is hoped that with the help of this guidebook, more individuals and communities will, in the words of the President's Commission, join in the "prairie fire of local action" and work together to tap the energy and vision to create a everexpanding network of greenways.



Chapter Two

WHY GREENWAYS?

The Value of the Greenway Approach



THE BENEFITS OF GREENWAYS

Creating greenways can benefit you and your community in numerous ways, both now and in the future. Although quite diverse, these benefits may be grouped into three broad categories: environmental, social and cultural, and economic. While each greenway has specific impacts, this chapter provides you with an idea of some of the multiple benefits that commonly result from greenway efforts. Feel free to borrow from these ideas as you publicize the greenway concept in your community. Although no greenway

the range of potential uses and users of a greenway increases so too will the constituency that supports it.

can be expected to yield all the values listed below, remember that as

ENVIRONMENTAL BENEFITS

By their very nature, greenways benefit the environment by preserving the integrity of natural systems. They help conserve and enhance our

resource base, and protect the plant, wildlife, and human populations which depend on the health and well-being of our natural environment. In particular, greenways can:

- protect, conserve, and link together natural resources and open areas
- preserve environmentally-sensitive areas
- help protect endangered species and their habitat



Pepperell Pond on the Nashua River in Groton.

- revitalize threatened and degraded resource areas
- protect fish and wildlife habitat
- connect isolated habitat areas and help preserve biological diversity
- provide natural buffers along waterways and enhance water quality by trapping and filtering pollutants
- slow runoff, which helps groundwater recharge, filters nonpoint source pollution, and reduces flooding, erosion, and stream sedimentation
- conserve wetland areas

In more developed settings, greenways can:

- provide shade and help to absorb sound and heat from buildings and streets
- help save energy by providing opportunities for nonmotorized transportation
- provide usable open areas within a developed landscape
- provide habitat for many species of wildlife



Visitors take a guided stroll on the Channing Blake Meadow Walk in Historic Deerfield. The handicapped-accessible walk winds past a working farm and pastures, linking the main street of the National Historic Landmark Village with the Deerfield River. Interpretive panels installed along the path describe the historic and environmental aspects of the surrounding landscape.

Amanda Merullo, courtesy of Historic Deerfield

SOCIAL AND CULTURAL BENEFITS

Greenways benefit society on a fundamental level by reconnecting people with the land and with one another. Through education, recreation, and preserving local character, greenways can help to restore or enhance our interactions with the outdoors and with the landscapes that define our cultural heritage.

From a social and cultural perspective, greenways can:

- provide recreational opportunities close to people's homes
- provide easy access to the outdoors at little or no cost
- promote interaction among people of different ages and socioeconomic backgrounds
- promote community wellness by encouraging exercise
- conserve and enhance community character by protecting the natural, cultural, scenic, and open space resources that create a sense of place
- encourage revitalization of urban waterfronts and cultural and historic resources, often improving the image and safety of an area
- enhance the utility of existing facilities and natural areas by linking them together
- create traffic-free routes between schools, shops, and parks
- act as outdoor classrooms for both school children and adults

Close and easy access to recreational opportunities encourages participation in outdoor activities, be it for exercise,



relaxation, or nature study.

This has an appeal that transcends generational or economic lines and enables people living in urban, suburban, or rural areas to experience the outdoors in their own neighborhoods. This sort of opportunity will enable people to develop a better appreciation for the natural environment and will hopefully foster a sense of stewardship and responsibility among all members of society. Building a diverse group of outdoor advocates throughout Massachusetts will help ensure that our natural and cultural resources flourish for generations to come.

In addition to the direct social benefits listed above, greenways can play an important role in land-use planning and growth management. The key here is to focus on the positive aspects of creating greenways and on their compatibility with development. In this context, greenways can:

- provide a positive way to shape growth
- act as lines of demarcation and buffer incompatible land uses
- direct development away from sensitive areas
- act as landmarks or points of reference in the land-use planning process

GREENWAYS AS CLASSROOMS

"greenway" conjures up multiple images: resource conservation, natural corridors, and recreational pursuits—biking, hiking, rollerblading, canoeing. But greenways also make for great outdoor classrooms, especially in urban areas where natural areas are a scarce commodity. These corridors offer a firsthand opportunity to view plants and wildlife in their natural habitat and to understand how human activities—past and present—impact the landscape.

A growing number of teachers and youth leaders are following this cue and have developed projects that use nearby greenways as their outdoor classrooms. In so doing, they encourage young people to see that learning does not have to begin with a textbook but can come from observing the world around them and asking questions. A sample of these innovative programs is profiled below. Each approaches education using greenways in a different way, providing a kaleidoscope of ideas on how greenways in your community can be utilized as a teaching tool both within and outside the classroom.

MINUTEMAN COMMUTER BIKEWAY

In 1993, the eleven-mile-long Minuteman Commuter Bikeway linking Bedford, Lexington, Arlington, and Cambridge was completed after a seventeen-year effort. In the fall of that year, Steven Levy, a fourth grade teacher at the Bowman Elementary School in Lexington, posed an interesting question to his students: What is the biggest change that has hap-

pened in your town since you were born? After some discussion, one student offered "the bikepath," and a year-long class project was born. The students investigated ten different aspects of the bikeway, such as the history of the land, the planning process, the impact of the path on abutters and local businesses, how paved bikeways are constructed, environmental issues, etc. The bikepath was clearly a rich topic for exploration and learning, and one which allowed Mr. Levy to weave in the underlying basics of a fourthgrade curriculum: math activities, such as graphing different uses and volume of traffic; science that included the study of simple machines, the bicycle being a perfect example; English and grammar, enhanced through letter-writing campaigns and the final booklet documenting the class's work; and the social studies theme of colonial life and local history,

researching how the land wan riginally used as well as the trail's former life as a major railroad corridor. It also provided fertile ground for enhancing the theme of civic responsibility, encouraging the students to become more active community members and responsible town stewards. The bikepath was also very relevant for the students since it provides a safe link for them between their homes, school, and the town center.

The project began with asking a variety of questions, organizing them by category, and having the students break into small groups to research one topic in depth. Throughout the year, however, the class participated in a number of joint ventures. The planning directors of Lexington and Arlington came in to talk about the planning process. A community member spoke about the politics of planning and the instrumental role played by various citizens to



Students from Mr. Levy's fourth grade class celebrate their year-long study of the Minuteman Commuter Bikeway with an all-day biking expedition and treasure hunt along the bikeway.

Steven Lev

gain support for the project. Lexington's Town Engineer explained the principles of construction and how to budget for such a job. Similarly, the class was visited by a bicycle enthusiast, a railroad historian, and the police. Students researching the impact on abutters visited Town Hall and learned how to read assessors maps and how to identify properties that bordered the bikepath. Pupils studying the effects on local businesses interviewed shop owners, while others interviewed users and published a user survey in the local paper. In addition to these pursuits, Mr. Levy brought in an old, singlespeed bicycle and each study group took turns taking it apart and putting it back together. This led to the class soliciting donations of old bicycles in need of repair, which they then fixed up and presented (along with donated helmets) to their "sister" class in Lawrence.

As the students' research took form, the class decided to produce a book to share their findings with the community. The resulting documentary, On the Path, was written, edited, and illustrated by the students, and reports on every aspect of their investigations. Available for sale at local bookstores, this eightypage booklet has contributed significantly to public awareness of the bikeway. Inspired by requests from neighboring towns and other educators to share the process and results of his class's project, Mr. Levy decided to produce a video on their study of the Minuteman Commuter Bikeway. During the course of the year, Paul MacGowan of Burlington, Vermont, had collected over twelve hours of videotape documenting every aspect of the project. With support from a DEM Greenways

and Trails Demonstration Grant, the two men collaborated to produce a fifty-minute tape and written accompaniment that they believe will inspire other teachers to plan and implement a curriculum like this in their classrooms. By providing visual examples and guidance on how all academic disciplines can be incorporated into a project like this, they hope more

Jn this project, what might have been a single class assignment blossomed into an activity involving the community.

teachers will engage in projects which involve children directly in issues that are of importance to their communities.

In this project, what might have been a single class assignment blossomed into an activity involving the community. The fact that the bikeway represented a major change in town, as perceived by the students, triggered a wideranging study that led the class to explore unanticipated areas of learning and to interact with a cross section of local residents. The end result was to further highlight and strengthen the importance of this greenway throughout the community.

For additional information on On the Path or the accompanying video, contact Mr. Steven Levy, Bowman Elementary School, 9 Philip Road, Lexington, MA 02173; (781) 861-2500.

NEPONSET RIVER GREEN-WAY PROJECT

While classrooms provide one setting for learning, on-site training has an appeal all its own. Greenways are an ideal conduit for this, as was demonstrated by the Neponset River Greenway Youth Conservation Team.

Home to deer, harbor seals, great blue herons, and snapping turtles, the Neponset River is the unpolished jewel of Boston's Mattapan, Dorchester, and Hyde Park neighborhoods. In an effort to increase interest in the environmental diversity of this urban area, the Boston Natural Areas Fund and the Trust for Public Land joined forces to initiate the Neponset River Greenway Project. Seen as part of a larger four-year effort, "Greenways to Boston Harbor," the Neponset River Greenway project aims to develop responsible stewardship for the River by showing adjacent communities how the greenway and river can be natural, cultural, and recreational resources. A Greenways and Trails Demonstration Grant provided important seed money that leveraged other more substantial funding needed to complete the project.

The Youth Conservation Team has been the force behind many of the project's most visible accomplishments to date. This summer youth employment and environmental education program involved about thirty teens from five Boston neighborhoods. Through exceptionally hot weather and bouts with poison ivy and insect bites, they cleared away thick undergrowth to construct trails and overlooks along the banks of the river, allowing visitors access to sections of the river in Dorchester and Mattapan for the first time. They also

blazed a trail along the river's edge within the Neponset Reservation in Mattapan, incorporating river views, physical access and habitat preservation into their plans. In addition to their outside labors, the teenagers devoted one day a week to environmental education and skill development. A naturalist from the Massachusetts Audubon Society intro-



Members of the Neponset River Greenway Youth Conservation Team use a water testing kit to measure levels of dissolved oxygen, turbidity, temperature, and other

factors to determine how the state of the water affects river life.

duced them to the fundamentals of ecology and environmental analysis through water quality testing and familiarizing them with the wildlife and vegetation at their main work site. Another day was spent with staff from the Commonwealth's Adopt-a-Stream program showing them how to do shoreline surveys. MDC staff archeologist and naturalists led the team on a cultural and natural history exploration of the river via canoe. Under the guidance of the Boston Water and Sewer Commission, the group learned about the operation of the city's sewers and how to identify illegal sewerage lines draining into the river. And they discovered the ins and outs of design through a fullday charette organized by the Planner's Collaborative. By requiring all participants to record any significant environmental observations each day, the team learned, as their blue T-shirts proclaimed, to "Think Like a River."

The positive response to this summer debut was an extension

of the Youth Conservation Team as a Saturday program for seven teens into the fall. They continued to improve and extend the Mattapan trail and to participate in river clean-ups, while undertaking the task of stenciling catchbasins in the area with the message, "Don't Dump!—Drains to Boston Harbor." Organizers of the Youth Conservation Program will continue to focus on action projects as they work to expand their efforts into an annual or yearround effort.

By the increased community use and enjoyment of the Mattapan Trail, it is clear the project serves a need and enriches the quality of life of local residents and visitors alike. But, of equal importance, it actively involved area teens in creating this benefit, building a sense of civic responsibility and community stewardship that comes from helping to create positive change in one's own neighbor-

For additional information on the Neponset River Greenway Pro-

ject, contact the Boston Natural Areas Fund, Inc., 294 Washington Street, Room 301, Boston, MA 02108; (617) 542-7696. This profile was based in part on an article by Ed O'Brien, Neponset River Greenway Coordinating Council Member, that appeared in the a Boston Natural Areas Fund Newsletter.

LEARNING FROM THE TEN MILE RIVER

The dynamic nature of rivers and the diversity associated with them combine to make these habitats a natural outdoor laboratory. Helping teachers and interested citizens discover for themselves the educational value of a river watershed was the impetus behind a half-day conference called Learning From the River. Organized by the Ten Mile River Watershed Alliance (TMRWA), the conference was part of a larger initiative to incorporate the Ten Mile River and its watershed into the science curriculum of the local schools in Massachusetts and Rhode Island. TMRWA's goal is to establish a network of science curricula in schools throughout the watershed, thereby providing a broader context for interpreting the results of individual projects done along the twenty-seven miles of river.

The conference was attended by nineteen participants representing eleven schools. A DEM

Greenways and Trails Demonstration Grant helped defer the conference fees and expenses for Massachusetts teachers, and allowed each to be awarded a mini-grant to purchase river-related sampling gear. Participants attended a series of workshops on subjects such as water quality monitoring, vernal pool certification, and "elementary connection," an integrated unit of math, science, literature, communications, technology, and social impact activities that can be adapted to a specific watershed such as Ten Mile River. Each workshop was geared toward how to weave streams and waterways into the teaching curriculum. Participants were also treated to a river tour narrated by an area historian who explained how the development of local cities and towns centered on—and was enhanced by—the Ten Mile River. Through hands-on training in simple sampling and analytical tools, and an introduction to relevant water quality standards, teachers were also provided a framework for analyzing project results between schools throughout the watershed.

Among the opportunities offered teachers as part of this program were mini-grants to purchase equipment for water sampling and for student projects. This gave educators the necessary tools to follow through on the material learned at the conference, and resulted in projects that showed a strong interdisciplinary mix and creativity on the part of both the teachers and their students.

Tanya Erban, a sixth grade teacher at the Martin School in North Attleboro, requested support to start a year-long water quality monitoring study of the Ten Mile River and associated aquatic environments, to look at water pH, phosphate and nitrate levels, dissolved

oxygen, temperature, and velocity. In cooperative groups, the students gained experience in prediction and analysis, later entering their results into the FreeNet computer Bulletin Board to compare with findings of other students and interested citizens in the watershed.

Wanda Pessini and other third grade teachers at Attleboro's Willett School undertook a study to introduce their students to a nearby pond and its inhabitants. Ms. Pessini wanted to expose her students to the concept of change, and to have them practice using scientific equipment—magnifying lenses, thermometers, pond auides—in activities that were authentic rather than just lab exercises. Their five field studies at the pond involved a diverse set of experiments. On the initial field trip, for example, the class participated in a scavenger hunt to find the largest plant, the tiniest animal, a plant that lives in water, an animal that flies, etc. Using nets and sample bottles, they collected organisms to identify, observe, measure and draw before releasing them back to their natural environment. Back in the classroom, the students followed this trip by writing a poem about Mechanic's Pond, developing a "pictionary" of pond life vocabulary, making a flip book showing the life cycle of a frog to reinforce the process of metamorphosis, and creating frog masks to increase awareness of the position of the eyes and the tongue action used as a frog captures its prey.

At St. John the Evangelist School in Attleboro, the third and fourth grade classes of Mrs. Chicone and Mrs. Jacques became Ten Mile River Sleuths to study insects and plants in and around the river. On each field trip, the students studied a different habitat: the river's surface, underwater, the ground level, and nearby trees.

Prior to each trip, the class learned about four insects and two plants characteristic of that particular habitat. Working in groups of three, the young River Sleuths used this background information to help them locate and observe each insect and plant. Back in the classroom, the students kept journals and drawings of their observations, using this information to undertake additional projects such as developing an insect and plant auide for the Ten Mile River, and making a magnified model of an insect. An underlying theme discussed with the students throughout the course of their investigations was the role of the river as a complex community of plants and animals interacting with one another and with their surroundinas, and the importance of monitoring the health of the river.

One goal of the Ten Mile River Watershed Alliance is to increase awareness of and foster an appreciation for the river resource. For many years the river was polluted by both urban and industrial waste. This legacy fostered an attitude of contempt for the river when, in fact, it is now fishable and contains abundant wildlife in many places. TMRWA feels the conference and mini-grant program substantially enhanced its outreach to the public through educating the young; exposing children to the world around them can't help but result in a more environmentally aware and active citizenry.

For more information on the Learning From the River teacher education conference, contact The Ten Mile River Watershed Alliance, 1 Sagamore Rd., Attleboro, Mass. 02703; (617) 287-7458.

ECONOMIC BENEFITS

The environmental and social benefits of greenways are quite compelling and have successfully stimulated interest and enthusiasm for greenway planning at all levels of government. However, these merits are very difficult to quantify and concrete economic benefits are often necessary to translate enthusiasm into official support, funding, and action. Many citizens, businesspeople, and local officials are concerned that greenways and greenway planning will cost their communities money in capital outlays, tax dollars, and maintenance. Over the last decade, a number of studies have been completed which address



Cross-country skiers explore the winter woods at Great Brook Farm State Park in Carlisle. In 1990, DEM permitted a private vendor to begin operating a ski rental concession and to groom the trails.

these very concerns and suggest that greenways can actually stimulate local and regional economies. They overwhelmingly indicate that while planning for and securing greenway corridors do cost money, the economic benefits, social gains, and environmental protection derived from these activities outweigh the initial and long-term costs we will incur if we do not directly address resource protection and recreational needs.

In terms of economic benefits, greenways can:

- * attract recreation- and tourism-based businesses, such as cross-country ski touring or bicycle and canoe rentals and trips
- generate local revenues through tourist and local spending at greenway events
- increase the value of adjacent properties, which enhances the tax base and helps to offset the lower tax revenues generated by open land
- save money by helping to conserve stream corridors, wetlands, and floodplains, thereby minimizing the amount of money a community may spend on repairing flood damage
- reduce the amount of money spent on cleaning up and seeking new drinking water supplies by helping to protect water quality

ADVANTAGES OF THE GREENWAY APPROACH

In addition to the positive impacts of greenways themselves, the greenway *approach* to resource protection offers a number of advantages.

GREENWAY PLANNING IS PRACTICAL

Dollar for dollar, greenways often provide more protection and a greater degree of access than some of the more traditional land protection efforts which focus on setting aside large tracts of land. Because of their linear nature, greenways do not require an extensive amount of land, offering an efficient and effective means of protecting a diverse

resource base and increasing public access to recreational opportunities.

Greenways provide a logical means of managing a variety of resource areas which are often dispersed throughout the landscape. They emphasize existing landscape features and use them as the framework for planning. Because these natural areas rarely coincide with municipal boundaries, greenway planning often leads to a more environmentally-based, regional view of land and resource management. Greenways also offer an opportunity to take a holistic approach to resource protection by

explicitly planning for the joint use and protection of natural, cultural, and recreational resources.

Greenways are sensitive to current recreational needs and demands. In 1987 the President's Commission on Americans Outdoors found that not only are the recreational demands of the American people growing, they are also changing. Based on their research, the Commission found that people want convenient and continuous access to recreational opportunities close to their

homes. Greenways are structured to meet these demands.

Connecting existing resources, patches of open space, and linear strips of land and water creates meaningful open space networks. While some of the resources included in greenway systems are valuable in and of themselves, individual fragments may not be appealing or inviting to potential users, may not be adequate to support wildlife, or may not effectively protect the environment.



Volunteers from the Andover Committee of the Appalachian Mountain Club build a bridge to connect the Andover and Lawrence segments of the Merrimack River Trail.

Weaving them together, however, greatly increases their ability to meet both environmental and recreational demands, and the whole greenway becomes a great deal more than the sum of its parts.

Because greenway corridors are linear in nature, they are ideal for providing multiple access points. This encourages use by a broader range of people, whether they are out for an afternoon stroll or bike ride, a long-distance hike, or a day-long canoe trip.

Ken Tentarelli

GREENWAY PLANNING IS FLEXIBLE AND ADAPTABLE

Every greenway is unique and reflects particular interactions between people and the land. Greenways can be established in urban, suburban, and rural areas, and they can address a variety of goals and objectives. In addition, the goals and priorities of greenway efforts often change over the length of the corridor and can be implemented accordingly across a region. This enables a community to achieve specific local goals while complementing and becoming part of a regional system.

GREENWAY PLANNING ADDRESSES THE NEEDS OF SEVERAL USER GROUPS

Greenways are appealing to many different types of individuals and organizations. By involving citizens and public officials who may not normally work together, greenway planning efforts are able to build extremely diverse constituencies. These interactions and a broad base of support can help counter,

or even eliminate, opposing points of view. In addition, cooperating on a project often fosters a sense of trust and develops a basis for future planning efforts.

These same benefits can be realized beyond the boundaries of a single neighborhood or town. Many greenway efforts bring together people from different towns as partners. Success in planning a regional greenway may encourage a more regional approach to other planning initiatives in the future.

GREENWAY PLANNING IS A CITIZEN BASED EFFORT

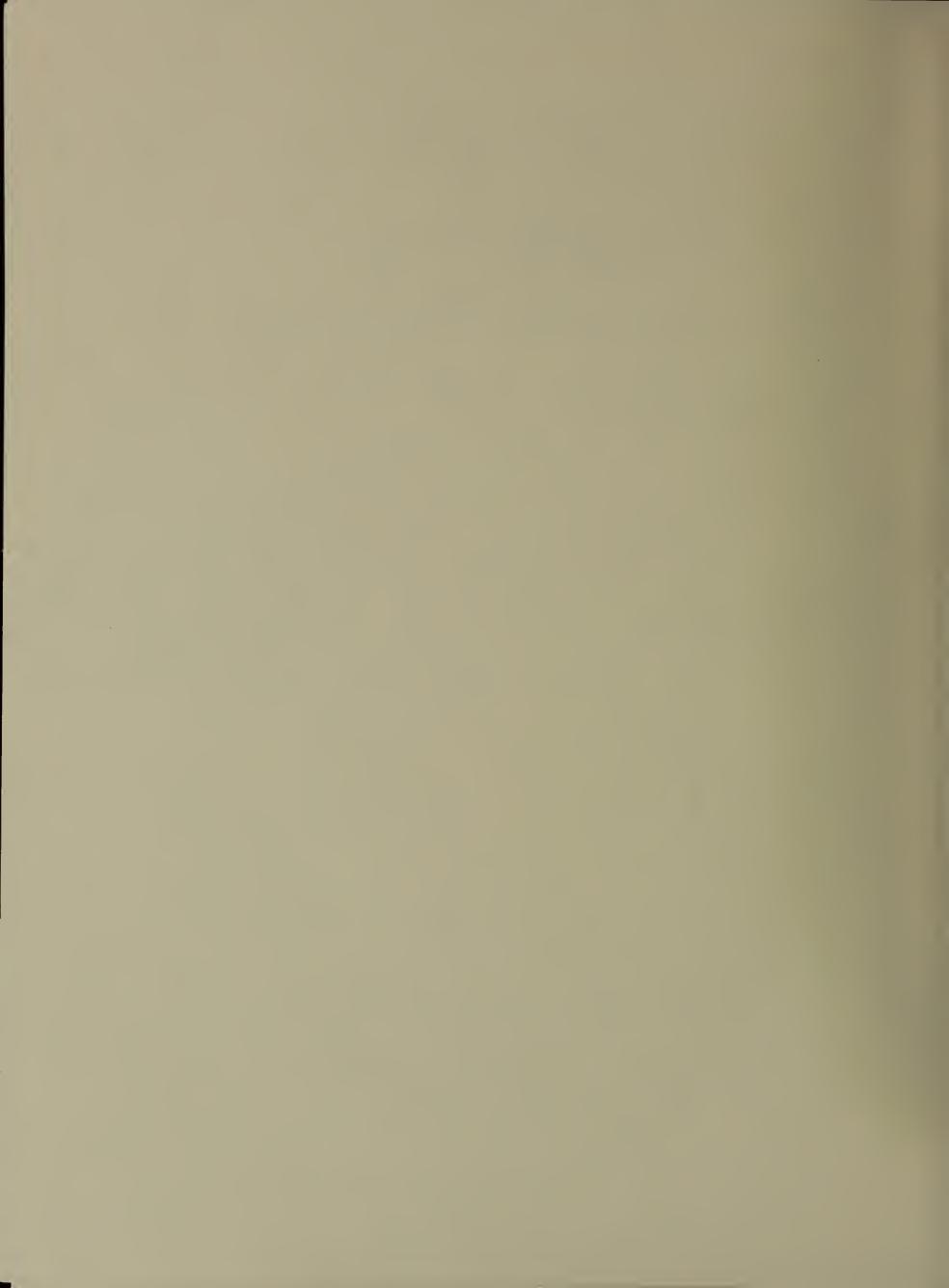
Most greenways are born out of the hard work, enthusiasm, and perseverance of ordinary citizens as they strive to transform their ideas into realities. Playing an active role in establishing a greenway is empowering. It enables us to create something positive and tangible for ourselves and for our communities. Involvement in greenway planning fosters civic and personal pride, and helps to create or restore a feeling of community which is fast becoming a rarity.

Section Two

Developing a Greenway Strategy

A man's mind, once stretched by a new idea, can never regain its original dimension.

-Oliver Wendell Holmes



Freenways provide an alternative approach to open space and resource protection. In light of the variety of potential land uses competing for the remaining open spaces in the Commonwealth, simply relying on areas where development is not occurring is no longer an effective means of satisfying open space and recreational needs. As open space advocates, we must take a proactive stance and strategically manage our remaining resources to ensure that quality recreational opportunities are available and critical areas are conserved.

Creating a successful greenway requires you to step back and take a hard look at what exists in terms of natural, cultural, financial, and human resources in the context of the social and environmental needs of the area. This comprehensive assessment will help you define realistic goals tailored to your particular greenway effort, and help ensure that recreation and conservation occur in the most appropriate areas.

A variety of methods can be used to create greenways. One approach involves securing a corridor based on a particular resource or important area. For example, many greenways grow out of the desire to protect and to provide access to an important stretch of river. Another basic approach is to conduct a broad-based inventory to determine the most appropriate location for a greenway network. This kind of activity usually follows or works hand-in-hand with town or regional open space planning initiatives.

Whichever route you choose, it is essential to develop a strategy articulating what you want to accomplish and why. A well-formulated strategy will guide your efforts, keep your initiative focused, and illustrate that your greenway proposal is the result of a rational planning process. Based on these goals and objectives, your strategy should also define and eventually map the nature and location of your proposed greenway. Putting your ideas in writing is a good way to clarify them and to get

feedback in refining this essential piece. In addition, the written component of your greenway strategy can be used as a publicity tool to engender support and to solicit funds. It is important to keep in mind however, that while the actual document is important, a greenway strategy isn't simply a report but rather the synthesis of extensive research and public participation. It should be a working document, continuously evolving to accommodate new information, opportunities, and political and financial realities.

The remainder of this guidebook details the process for planning and establishing a greenway. It begins with a chapter on initiating your greenway project, continues with a step-by-step description of project planning and implementation, and concludes with suggestions for maintaining your newly established greenway. Although many of the steps actually occur simultaneously, this process is described in a linear fashion, beginning with defining your project and ending with maintaining your greenway.

The information presented in the remaining chapters is general and should be adapted to your needs, which will vary depending on the type and scope of your project, the experience level of those involved, and the current stage of your greenway planning efforts. As you read the remainder of this guidebook, feel free to focus on those ideas and suggestions that will be most helpful to your greenway project. Spend some time looking at the profiles and examples scattered throughout the text as sources of information and inspiration. And most importantly, never hesitate to ask questions or to seek advice—we can all learn from the challenges and successes of other greenway efforts.

Chapter Three

GETTING STARTED

Organizing a Greenway Initiative



Beginning a greenway planning project is similar to initiating any type of major program or campaign. Among the essential first steps are identifying an important project or idea, forming a core group of committed individuals, and publicizing your ideas.

DEFINING YOUR PROJECT: CULTIVATING IDEAS

It is very important to pick a project that is meaningful to your community, one that will have a tangible impact when completed. Ideas for a greenway project can grow out of particular community needs or problems, such as a shortage of recreational opportunities or the degradation of a river. They can also arise out of more general issues, such as concern over loss of community character or a local desire to protect open space. Greenway projects call for long-term planning and commitment rather than a short-lived effort aimed at quick results, and your project should reflect this reality.

To determine your community's needs, take a good look around your town. One way

to do this is to organize an outing or series of outings to evaluate your town's assets and needs. Because landscape changes are often incremental, it is sometimes difficult to notice the cumulative impacts of what is occurring around us. Several informal field trips can help to identify existing environmental conditions, changes in land use, and issues that need to be addressed, ultimately generating ideas and opportunities for potential greenway projects.

It is helpful to supplement data gathered in the field with historical information about your community and region. Looking at the events that gave rise to current land-use patterns and practices can provide insight into the problems and issues that exist today. Historical information about your community can usually be obtained from the local library or from nearby college or university libraries, from local newspaper archives, or from annual town reports. The Massachusetts Historical Commission is another potential source for this type of data. Some communities have a local historian and/or a local historical museum with papers, books, and photographs documenting the town's past. Your local Conservation Commission or Planning Board may also be able to provide insights into issues related specifically to land use.

Along with research on your town, start to educate yourself and your colleagues about greenways and greenway planning (see Appendix A for useful reference materials). One of the most effective ways to learn about the various types of greenways is to visit them. This will give you a real sense of the kinds of opportunities greenways provide and it will help you visualize what you want to work toward. You may also wish to contact other greenway groups for advice, encouragement, and technical assistance. A great deal can be learned from informal conversations with fellow greenway advocates, not only about their accomplishments but also about the problems they've encountered.

Your initial observations, reconnaissance, and research will generate a number of ideas, as well as uncover issues that will need to be addressed. At this point you may find it helpful to contact local groups, town boards,

and regional and state agencies to get their input and insights on your ideas (see Appendix B for sources of planning and technical assistance). It is also important to determine if any similar projects have previously been attempted in your community, and the outcome of these efforts. Reactions to your ideas and information about analogous projects are often good indicators of the originality of your ideas, the political climate, and the kind of help or hurdles you can expect in the future. Communication with a broad range of organizations in the

early stages of your project will also help to foster relationships with groups and individuals that you may be interested in working with in the future. This is the time to sow widely the seeds that will be harvested later as support for your greenway.

Discussing your ideas with others is an essential part of the greenway planning process. An open dialogue can generate a great deal of useful information, educate a variety of individuals, help publicize your efforts, and garner public support. You will, however, need to use your judgement and knowledge of your community to determine how much detailed information to discuss at this point in the process. This will likely depend on the nature of the project and on your community. If, for example, your greenway project is fairly well defined and you expect there will be significant opposition, you may not wish to discuss the exact location of the proposed corridor prior to gaining stronger public support. This does not mean that you should proceed secretly. Neverthe-



More than one hundred residents of Lenox, Lee, and Stockbridge participated in the Tri-Town Housatonic River Greenway Vision Mapping Project to share their ideas for a cleaner and greener Housatonic River. Suggestions included creating walking trails, bicycle paths, canoe launches, fishing piers, picnic pavillions, bridges and interpretive signs, and preserving large tracts of open space.

Craig F. Walker

less, it is sometimes necessary to exercise caution in order to avoid negative reactions before you get the project off the ground.

If you or your small group began with a specific project or location in mind, this initial brainstorming phase is a good time to consider the bigger picture and to look at your ideas in a regional context. While most of your efforts will be focused on getting your particular project off the ground, it is always important to keep a long-range plan in mind. Maintaining a broad perspective increases the potential for expanding your greenway and for connecting it to a regional network in the future.

THE PROJECT GROUP: FORMING A GREENWAY COMMITTEE

Establishing a formal committee or council early in the process will give your initiative credibility and will help to ensure that it proceeds in an organized and effective fashion. In the beginning especially, enthusiasm and commitment to the project idea are more important than expertise. Information and financial support can always be gathered from outside sources, but motivation and dedication must come from within your core group.

An alternative to forming a brand new greenway committee is for an existing community organization, such as the Conservation Commission, Open Space Committee, or a local land protection organization to adopt the greenway project and to become its sponsor. This can work quite well. The Discover Hamilton Trail, for example, was developed by the Town Conservation Commission. This 9.9-mile-long trail links greenways in Hamilton with the Bay Circuit Trail in Ipswich and with the Hamilton Historic District. It is important, however, to make sure that the overall goals of the group you are hoping to

work with are compatible with yours so that the partnership will not compromise your project or limit the potential constituency of your greenway effort. If you suspect this may be a problem,

you may be better off forming a new committee and asking representatives from these various groups to join.

Whichever route you choose, it is essential to select a leader early in the process. Again, the leader isn't necessarily the individual who is most knowledgeable about greenways and open space planning. More importantly, the person you choose must be truly committed to the project, have the time and energy to devote to it, and possess excellent communication and organizational skills. In addition, an effective leader must be able to:

- keep the big picture in mind while focusing efforts on necessary details
- delegate important tasks and responsibilities
- recognize the strengths and weaknesses of others
- initiate and focus group discussions without dominating them
- recognize and articulate good ideas
- get along with all types of people and enjoy working in a group
- inspire the group and keep its progress on schedule

(adapted from The Open Space Planners Workbook)

THE VISION STATEMENT: ARTICULATING YOUR PROJECT CONCEPT

nce you've collected some information, gotten initial input from fellow citizens and open space advocates, and established a project group and leader, you are ready to define the overall vision for your greenway. The project vision communicates a general idea of what will be accomplished through your efforts. It is the conceptual definition of the corridor you hope to establish and protect, and may include some of the reasons your group feels this effort is essential, and what a greenway plan will mean for the community. The project vision will become the underlying theme that guides your initiative and ties all your efforts together. At the same time it is the ideal endpoint you hope to reach in the future. Articulating this vision is an ongoing process open to change as the project evolves.

Defining your vision may at first seem like a daunting process. One way to begin is to raise a series of questions and issues with the other members of your group. Discussion topics might include:

- specific resources and areas that are important in your community
- various types of greenways and their applicability to your situation
- why and how a greenway could benefit your community
- possible locations for the corridor
- potential uses and users
- what you hope to achieve through this effort
- would your town support such an initiative

Several themes are likely to emerge through this dialogue. It is often helpful to further articulate and discuss these key topics and to then list them in order of priority. In determining your vision statement, remember that the interests within your community are many; some people may focus on wetland

SAMPLE VISION STATEMENT

Wachusett Greenways wants to link our communities in the heart of Massachusetts through trail corridors and open spaces...Wachusett Greenways envisions a network of multi-use trails that would connect parks, schools, and neighborhoods, as well as giving access to nature.

Excerpted from the Wachusett Greenway Exhibit, courtesy of Wachusett Greenways.

protection, others on providing safe biking routes, and still others on preserving an agricultural landscape. As a rule, the more local interests that are addressed, the broader and stronger the support base. This process will usually entail both negotiation and compromise. In the case of the Merrimack River Trail, for example, the primary purpose of the project was to protect and conserve the River and adjoining lands. The planning group also saw trails as integral to their efforts even though they would increase access and put more stress on the River and its environs. In the big picture, the group felt this potential drawback was outweighed by the broader constituency base that would result from endorsing a multi-purpose greenway.

THE MILLERS RIVER GREENWAY: A COMMUNITY PLANNING PROCESS

The idea for the Millers River Greenway originated with efforts to rebuild the economic future of two industrial towns. In the fall of 1994, the Orange Revitalization Partnership (ORP) presented a number of ideas for the revitalization of this Franklin County community. One proposal suggested the creation of a greenway along the Millers River connecting the downtown areas of Orange and neighboring Athol, and possibly including a bikeway along the River. According to Deborah Becker, coordinator for the ORP, "One of the ways we thought best to revitalize the town was to look at our assets, and one of our main assets is the Millers River. We wanted to enhance the community's appreciation of the river, and we felt a greenway with parks along the river was a good way to bring attention to it." As discussions continued and the idea began to solidify, ORP sought out the collaboration of the Millers River Watershed Council and the Athol Downtown Partnership. Together the three groups have worked on a strategy for community planning, outreach, and involvement that is a model for the grassroots planning process and for how to build community support.

CULTIVATING COMMUNITY SUPPORT

The first step in building support for the Greenway involved the creation of a small citizen committee to begin to publicize the idea of a recreational trail along the river.



Millers River Greenway volunteers enjoy a view of the river from the site of a proposed bike path from Orange to Athol.

Greenway Committee members spread the word to hiking and biking enthusiasts and to others interested in natural resource protection within the community. At the same time, "neighbor to neighbor" meetings were arranged with abutters on both sides of the river from Athol to Orange to ask for their input on the idea. These landowners were shown the conceptual route of the greenway, giving them an opportunity to ask questions concerning safety, maintenance, and liability. Approaching abutters at this early stage left ample time to try and address their concerns or to work out a compromise plan acceptable to everyone. This might mean routing a path away from areas considered the most sensitive from a wildlife or wetlands perspective, or away from landowners who are not

interested in participating in the project.

The next step for the Committee was to better define a trail alignment for the greenway. With support from a DEM Greenways and Trails Demonstration Grant, the Committee hired a trails consultant to conduct a field survey of the river corridor lands and to propose a feasible route. In some areas this involved walking a property with landowners to take into account their concerns and wishes in terms of passage over their land. On a parallel track, the state's Natural Heritage and Endangered Species Program was asked to conduct an ecological survey of the proposed greenway route in response to concerns about the trail's potential impact on special habitats.

GOING PUBLIC

The trail consultant's study culminated in a public presentation of the proposed greenway routes to an audience of over one hundred citizens, including many affected landowners. In addition to presenting a map of the proposed route, the committee used the meeting to share its vision for the proposed greenway. It also addressed management concerns about the proposed greenway: safety, maintenance, and liability. With a strong letter of support from the Orange Police Chief, a committee representative explained that safety and law enforcement along the new trail would be handled by the local police and emergency services. Questions regarding liability were answered by a local attorney working with the committee.

The response from the community to the Millers River Greenway concept was very positive: greenway committee membership increased by over forty volunteers by the end of the meeting. In fact, Becker said that the number of volunteers wanting to participate prompted ORP to divide them into five subcommittees. The Abutter Negotiations group works on securing easements from property owners along the trail. The Management Planning subcommittee is compiling a comprehensive guide to the trail which explains its policies, goals, and agenda. Financial support for trail construction and planning is being addressed by the Fundraising subcommittee. The group handling Outreach is responsible for organizing volunteers, representing the greenway committee and its work to the public and town boards, and keeping the initiative in the public eye through

press releases. Finally, a Long-Range Planning subcommittee is exploring how this trail may be connected to other regional trails and to the local schools, an idea that was also discussed at the public meeting.

LESSONS LEARNED

As the subcommittees move forward with their tasks, they are philosophical on the time and process involved with making such a project a reality. One of the greenway committee members compares the project to building a house: "First there are the plans, then the foundation, then the walls...If the process is not done properly, there will not be a very stable house." But the Greenway Committee is quick to point out several other key ingre-

"First there are the plans, then the foundation, then the walls...If the process is not done properly, there will not be a very stable house."

dients for carrying out such a multi-dimensional project. First, involve community members from the start who will then make the project their own. Second, make an effort to identify and address issues such as potential liability, crime, management, and other

landowner concerns early on and up front. And last, recognize that you will not always be able to solve all the problems or resolve all the issues. However, you can (and should) think about them and show others, both those working on the project and the general public, that these items are under consideration and haven't been forgotten.

Although they still have a long road ahead, Greenway Committee members feel the support and enthusiasm of area residents continue to grow. "Everyone has pulled together to make a great start toward realization of a wonderful opportunity to reconnect the citizens of Athol and Orange to the river," says Becker. One reason for this support is that the purpose of the Millers River Greenway is multi-faceted. For some of the residents in the Orange-Athol area, it is seen as a boon to economic development efforts. For others it is a way to protect the Millers River and the surrounding natural resources. Some believe it will help promote an awareness of the River itself and of the benefit of environmental protection. The area schools see it as an opportunity to create outdoor classrooms to teach local children about the ecology and the natural and cultural history of the area. Many people are excited about the potential for recreational activities along the river, be they biking, rollerblading, walking, jogging, skiing or boating. According to Becker, "the Greenway offers something for just about everyone in this area."

For more information, contact Deborah Becker, Orange Revitalization Project, 205 Main Street, Orange, MA 01364; (978) 544-2845.



Yarmouth residents discuss potential trail corridors during a vision/mapping workshop.

The final step is to reach consensus on a broad vision statement for your project which can be used to present your ideas to the public. Give careful attention to being clear and concise. Getting bogged down in details at this stage will draw attention away from the real message you are trying to get across and may raise red flags to those not yet sold on the idea. Remember, too, that this vision represents the concerns and desires of a small group within your community. It should be used to guide the project and to generate ideas and support for the greenway, not to dictate its outcome. Your vision statement may change considerably by the end of the planning process as you discover new information and attempt to balance resource protection goals with other community concerns and interests.

PROJECT PUBLICITY: SPREADING THE WORD

Once you've decided on a general vision or concept for your project, it is important to educate other community members, to solicit feedback on your ideas, and to begin to build a constituency. Never underestimate the power and importance of building strong public understanding, awareness, and support

for your project. At this stage it is often beneficial to decide upon a name for your project to promote local and regional recognition for your program. Sponsoring a contest for the name and/or for designing a logo or trail marker for your project is a wonderful way to draw attention to your efforts.

Potential avenues for spreading the word include writing articles, editorials, and press releases for your local newspaper, communicating through radio and community access cable television, setting up a home page on the Worldwide Web, distributing brochures and flyers, holding public forums and work-

shops, offering field trips, working with your local schools, and contacting other groups and individuals whom you would like to involve in the process. The remainder of this chapter describes

EAST * COAST

A Trail
Connecting
Cities

GREENWAY

Developing a logo or trail marker can be an effective way to build name recognition for your greenway effort.

WRITTEN MATERIALS

some of these

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detail.

publicity meth-

Written materials offer an endless array of options from articles to posters to annotated maps. Written materials produced in the early phases of the planning process can present some of the specific information you've learned, as well as some of the questions and issues you've uncovered. Raising questions and asking for feedback is a nonconfronta-

tional way to draw your fellow citizens into the process.

The first step in producing written materials is to determine what you want to say and to whom you want to say it. Answering these questions will help you decide what information to include and the style or tone in which it should be presented. Tailoring written materials to target audiences is an effective means of providing specific groups with the information most relevant to their interests and concerns.

Writing articles for the local paper or for newsletters of local conservation organizations, land trusts, or similar groups, is an effective avenue for reaching a wide audience and for soliciting their input on your project concept. Thought-provoking brochures, articles, and editorials will educate readers and may generate commentary in the form of suggestions, questions, and concerns. The nature of these responses will help guide your project, point out the controversial issues, and identify potential allies and opponents. If nobody replies to your articles, however, don't assume they are not being read. While not evoking an active response, you are introducing new ideas and issues to the general public. Putting the word out early on will help familiarize community members with greenways and with your proposed initiative, so they will not be surprised when they hear more about it in the future.

When producing flyers or brochures, remember that most people are bombarded with thousands of pieces of information every day. In order for your materials to effectively communicate your message, they must be eyecatching, clear, and concise. Be sure to also include a name and phone number of someone to contact for more information. Once you've created a compelling flyer or brochure, there are three steps you can take to help ensure your materials end up in people's hands, and not in their trash or recycling bins.

First, distribute the materials by hand. This increases the likelihood that people will read the information and there's a better chance they will remember the name of your group or project if they can connect it with a face. Volunteering to help disseminate materials demonstrates your commitment to the project, and the personal contact provides people with an opportunity to ask questions or express concerns. When distributing flyers and brochures, it is important to be somewhat selective and accept the fact that not everyone will want one. Pushing materials on people may make them angry and can be detrimental to the reputation of your initiative.

Second, make sure the materials are available at several easily-accessible locations such as supermarkets, laundromats, nature centers, libraries, and town halls.



and serve as a vehicle to thank volunteers, town boards, local

businesses, and others who have contributed to your initiative.

Placing materials in a variety of places will enable you to reach a broader audience than is possible by hand distribution alone. In addition, an individual who chooses to take the information generally wants it and is therefore more likely to read it.

Finally, if you choose to mail written materials, be selective. It is often more effective to target specific groups of people, rather than to send a brochure to every person in town. You may also want to try a sample group at first to test your written materials before doing a larger print run. Being selective also helps to minimize the amount of printed materials wasted and cuts postage

costs. You must exercise caution, however, that this targeted effort does not come across as excluding certain groups or that an over-whelming positive response is not just a reflection of the orientation of the group that received the mailing.

Another avenue for getting the word out is to create a poster that gives an overview of the proposed greenway project, along with a contact for additional information. These can be hung in the same types of places where brochures are distributed, as well as on general bulletin boards or kiosks at town parks or shopping areas. Some stores will also display notices and posters as a public service. Hav-



The Sturbridge "Big X" poster shows a proposed town-wide system of trails and bikeways. The Sturbridge Trails Committee, with assistance from the National Park Service, produced the poster to build support for the many local trail initiatives, and to show how they could be linked to form a larger network.

ing school classes design posters or sponsoring a poster design contest is another effective publicity tool that reaches a wide audience. This is a wonderful opportunity to educate children—and through them, their parents—about the greenway idea. Bringing the schools into your educational efforts may also have rewards down the road if teachers and classes volunteer to help with your project.

Producing and distributing good written materials costs money. An effective way to reduce expenses is to ask local printers, copy shops, advertising agencies, and talented community members to donate their services. An acknowledgement of these services is often all a business or individual will ask for in

return. These types of in-kind contributions can have a significant impact on the quality and extent of your publicity campaign while greatly reducing the costs.

During the later stages of your project, newspaper coverage and public service announcements are effective ways to publicize the actual corridor and to advertise greenway events. It is essential to develop a good rapport with the staff of the local newspaper, radio and television station(s) as early in the process as possible. If they know you and your project, they will be more likely to help you write press releases and public service announcements, to cover your events, and to run your stories.

PUBLIC FORUMS AND COMMUNITY MEETINGS

Forums are a great way to introduce your group and your project to the community. There are many different methods of running forums and workshops, and the approach you choose will depend on your resources and on how far along in the process you are when you decide to hold one. If your group is fairly small and having difficulty formalizing its vision statement, you may wish to hold an informal roundtable discussion where a facilitator introduces some ideas and then leads a brainstorming session. The main purpose of this type of meeting is to generate ideas and to gather information, advice, and suggestions.

"Keeping community members informed of and involved in your activities will encourage better public participation, and persuade more citizens that greenways are beneficial."

Further along in the process when you have some specific information to convey, a panel discussion may be more appropriate. This format enables you to feature key members of your group such as the greenway committee leader, a member of the Conservation Commission and/or Planning Board, local business leaders, and a representative from one or more recreation or conservation organizations. Each speaker is given the opportunity to present their point of view on whatever

issues you decide to address, underscoring the diversity within your group. This variety will help appeal to the broadest range of potential constituents, and their different viewpoints will hopefully stimulate discussion about the many issues to be addressed. Through these dialogues, participants will begin to discover that greenway planning is extremely versatile, and that it can provide equitable and effective solutions to environmental, social, and economic concerns.

THE PLANNING PROCESS: TAKING THE NEXT STEPS

nce you've collected some meaningful information, established a core group of greenway advocates, generated an overall vision, and gained community support, it is time to develop a more detailed strategy for establishing your greenway. To do this you'll need to get a more accurate sense of the landscape, decide what the larger community thinks is important, and determine what some of the major sticking points will likely be. This can be accomplished through conducting a preliminary inventory of the types of land and of the general ownership patterns in your study area. It is also helpful to articulate your preliminary goals and priorities; at this point they can be general, especially if you have not yet identified the actual corridor.

As you proceed, it is essential to maintain a continuous dialogue with the public through newspaper articles, flyers, fact sheets, posters, public meetings, and the like. Keeping community members informed of and involved in your activities will encourage better public participation, persuade more citizens that greenways are beneficial, and keep you abreast of concerns and potential problems associated with your greenway initiative.

Chapter Four

UNDERSTANDING YOUR RESOURCES:

Inventory, Analysis and Goal Setting



ne of the key steps in protecting the integrity of any area is to identify its natural and human-made components, and to understand how they function and interact. To do this you will need to inventory your study area — its resources, ownership patterns, and land-use regulations. Analyzing these three data sets together will help identify specific resource and recreation needs, potential threats, and appropriate locations for your proposed greenway. A thorough analysis will give you a better understanding of your study area, and enable you to devise a strong greenway plan. It is not always necessary, however, to systematically inventory every feature in your study area. If greenway and open space planning in your region are already underway, or if strong landowner and community support already exists, you may need to modify or scale back the inventory steps described below. In addition, some of the resource types or issues outlined in the following sections may not be relevant to your efforts. As you proceed, remember that the basic objectives of the inventory and analysis phase are to identify the natural and human-

made assets in your study area and to understand how they interact, and then to decide which are the most important, and why. Discussing your findings with your group and with the community at large will help clarify the general goals for your greenway initiative.

It is likely that much of the basic information you will need already exists, either as maps or in written reports. A good place to begin is with town boards including the Planning and Zoning Boards, the Boards of Health and Assessors, and the Water, Sewer, Conservation, and Historic Commissions. Municipal open space plans and associated maps are another excellent source of information about a community's natural and cultural characteristics. State agencies, regional planning agencies, conservation organizations, and land trusts may also have relevant data they are willing to share (see Appendices B and C). Finally, check with local colleges or universities to see if any theses or research reports have been written about your area by students in planning, landscape architecture, resource management, or similar fields.

As you gather many different kinds of information, you will need to compile them in a way that provides you with a better understanding of your study area. One very effective method for doing this is to prepare a composite map, or a base map with overlays that can be evaluated together, to help pinpoint key resource areas, potential linkages, and possible problem spots. It is likely that a great deal of the information you need has already been mapped. Features such as soil types, vegetative cover, and land ownership are all available in mapped form, although you may need to reduce or enlarge the maps to reach a common scale for easy comparison. In addition, if you are working on a multitown project, you may have to piece together the data from several towns to get the regional perspective you will need.

LOOKING AT THE RESOURCE BASE

A logical place to begin is with an inventory of the physical features of your study area to help describe the nature of the landscape you are considering. The kinds of information you'll want to gather fall into several broad categories — natural resources, cultural and historic sites, scenic features, and recreational opportunities. Keep in mind that some



Members of the Bennett Brook Watershed Association look over the results of a resource inventory for their area.

resources may logically fit into more than one category. A river, for example, may be viewed as a natural resource, as a cultural resource because of its former use in commerce, and as a recreational asset. It is also likely that some resource types may not be relevant to your efforts. For example, a detailed soils map may not be necessary if you are creating a greenway linking historic buildings and parks in a city.

It is important to take the time to sit down and figure out what type of information will be most useful to your specific greenway project, and to focus your inventory efforts on those areas. The categories and types of resources outlined in this chapter are intended only as a framework to guide data collection. As you are developing your inventory, do not hesitate to recategorize or to add other types of information which may enhance the development of your greenway project.

NATURAL RESOURCES

The main purpose of this part of the inventory is to identify and map significant natural features in your study area. These features may include topography, soils, hydrologic and geologic features, vegetation, and fish and wildlife. Each of these areas is discussed below.

TOPOGRAPHY

Topography is the shape of a landscape,

defined by changes in elevation over distance. These changes are represented by contour lines on topographic maps. The patterns made by the contour lines reflect actual changes on the ground and depict hills, mountains, ridges, ravines, valleys, and plains. Topographic features impose a natural order on the land and greatly influence its use. Analyzing the topography of an area can provide insight into how and why land-use patterns developed as they did, and can suggest



Hikers enjoy a panoramic view of the Holyoke Range, the only eastwest oriented mountain range in the eastern United States.

ways in which future patterns may evolve. Of particular interest to greenway planning, topographic maps point out natural corridors such as ridges or river and stream channels. They can also be used to determine steep slopes. In addition, identifying points of high elevation can be useful in recognizing potential vistas and in delineating drainage basins.

Topographic information can be obtained from United States Geological Survey (USGS) Quadrangle Maps. These also show buildings, roads, wetlands, streams, rivers, lakes, and gravel pits. Topographic maps are available at many bookstores and outdoor supply stores. They may also be purchased from Cartographic Information Research Services at UMass–Amherst or from the USGS Map Distribution Center in Colorado (see Appendix B).

SOILS

Soil is the substance that land is made of and thus supports every land use. Soils data can help to identify a number of landscape features including areas commonly flooded, shallow depth to bedrock, high water table, gravelly areas, and steep slopes. This kind of information can be used to determine the suitability and limitations of particular areas for various land uses. In addition, basic soils information can be aggregated to identify areas of prime agricultural, poorly drained, or highly erodible soils. Grouping soils by what they can support is a valuable way to indicate how they are related to future land use.

Soils data can be obtained from the United States Department of Agriculture, Natural Resource Conservation Service (NRCS). formally known as the Soil Conservation Service (SCS). These soil surveys categorize and map soils based on particle size and other prominent characteristics. In working with NRCS data, it is important to remember that the basic premise of the classification system is to separate the landscape into segments which can support similar uses and which have similar management requirements. This type of delineation can be extremely helpful in making preliminary assessments, but should be confirmed by an on-site inspection before conservation and development decisions are finalized.



This farm field in Whately lies in the Connecticut River Valley, which contains some of the most productive agricultural soils in the world.

Harry Dodson

WATER RESOURCES

This category of resources includes surface water, wetlands, and flood hazard areas. Clean water is essential to most forms of life, and protecting water resources is crucial to maintaining a healthy environment and high quality recreational opportunities. Information about the nature and location of water resources will help identify areas that need protection as well as opportunities for waterbased recreation. Remember that water is a dynamic resource and every water body is part of a larger system or watershed. Considering the "bigger picture" will help identify potential threats to water quality that exist outside your study area, as well as the impact your proposed project could have on the larger system. In 1993, EOEA introduced a

Water is a dynamic resource and every water body is part of a larger system or watershed.

Watershed Initiative, which established the watershed as the framework for efforts to improve water quality and community stewardship throughout Massachusetts. See Appendix C for more information about the Watershed Initiative. For more information on water resources, contact the Department of Environmental Protection (DEP), Division of Water Supply, or the Department of Environmental Management (DEM), Office of Water

Resources. Technical assistance is also available for coastal communities from the Massachusetts Coastal Zone Management program. See Appendix B for further information on these state agencies.

Surface Water

Information about lakes, ponds, streams, bays, estuaries, and reservoirs can be found on USGS topographic maps, National Wetland Inventory maps, and by looking at aerial photographs. You may also wish to consult the Massachusetts Water Supply Protection Atlas, updated annually by the Department of Environmental Protection (DEP), Division of Water Supply. It uses overlay maps on USGS topographic maps to show surface drainage basins, the location of public drinking water supplies, and potential sources of contamination (e.g., salt storage sheds, landfills). Check for availability of this manual at your library, town hall, or regional planning office.

Wetlands

Wetlands play an essential role in maintaining water quality, regulating stream flow, and supporting wildlife. Most of these areas are protected from dredging and filling by the Massachusetts Wetlands Protection Act. This law is administered by municipal conservation commissions. For each wetland-related project, these commissions set specific requirements for how wetlands are to be protected and buffered. However, beyond this buffering the law does not necessarily prevent degradation caused by adjacent or nearby development. It is therefore essential to consider each wetland in the context of the larger hydrologic system when making conservation, recreation, and development decisions.

USGS topographic sheets and National Wetland Inventory maps are good starting points for obtaining wetlands data. For greater detail, check DEP's Water Supply Protection Atlas or consult the Wetlands Conser-



Scenic view of the Blackstone River from Lookout Rock, located along the King Philip's Trail within the Blackstone River and Canal Heritage State Park. The Blackstone River meanders across the landscape, creating acres of wetlands, which are important for flood control and provide critical wildlife habitat.

vancy Program within EOEA. Because of their scale, these maps may not enable you to fine tune the boundaries or to detect smaller wetland areas. Whenever possible, site visits, aerial photographs, and locally-generated maps should supplement this information.

Flood Hazard Areas

A flood hazard area, often referred to as the one-hundred-year floodplain, is the area surrounding a stream or river that would be flooded in a storm that has a one-percent chance of occurring or being exceeded in a given year. These areas have been delineated on Flood Insurance Rate Maps produced by the Federal Emergency Management Agency (FEMA). Communities must regulate development within these areas according to FEMA minimum standards if they want to make federal flood insurance available to their residents. Copies of these maps are available for purchase from FEMA. They can also be reviewed at most Town Halls or at the Flood Hazard Management Program within DEM's Office of Water Resources (see Appendix B).

In general, flood hazard areas are most suitable for uses which do not require structures, such as agriculture, recreation, and open space. They are often quite scenic and provide valuable habitat for wildlife. In addition, many of these areas, particularly those which also contain wetlands, are not considered readily "developable," which tends to reduce their fair market value. This may increase the economic feasibility of including them in your greenway. However, not all land lying within flood hazard areas is automatically protected. The degree of protection depends on the nature of the floodplain and on the local regulations in place.

GEOLOGIC RESOURCES

This category includes unusual geologic features such as caves, cliffs, ravines, gorges, glacial potholes, rock outcrops, and drumlins. These unique resources have taken thousands and thousands of years to form and can reveal much about an area's history. They are worthy of protection and can make ideal focal points within your greenway. For more information about geologic resources in your community, call the State Geologist or try contacting the geology department at a nearby college or university (see Appendix B).

VEGETATION

This group of resources includes rare, threatened, and endangered species and critical habitat areas, as well as plant communities representative of your part of the state. Of particular interest are large tracts of contiguous woodlands and stands of old-growth forest, both of which are fast becoming rarities. Vegetation resources have ecological, recreational, and economic value. In addition, the way they are dispersed over the landscape helps to create the character and scenic quality of a place. When gathering vegetation data, it is important to think not only about the individual resources but also about their significance in the larger landscape. For example, a series of hedgerows separating farm fields may provide prime habitat for birds and small game. Cutting them down would remove an important source of food and cover for these species, but it would also alter the entire character of the area.

Some of the best sources for information on vegetation are: aerial photographs or land-use and forest cover maps, often available through local Planning Boards and Conservation Commissions; the Resource Mapping/Land Information Systems unit within the Department of Forestry and Wildlife Management, UMass/Amherst; the Massachusetts Natural Heritage and Endangered Species Program within the Department of Fisheries, Wildlife and Environmental Law Enforcement; and the Division of Forests and Parks within DEM (see Appendix B).

Input from long-time residents or site visits by a field botanist can also be quite valuable. This is especially true for an evaluation of understory or herbaceous species. It is also a good idea to conduct site visits at several times of the year to document the seasonal change. Spring ephemerals, for example, bloom for only a short time each spring and usually even their leaves have all but disappeared by mid-summer. Basing a trail layout on a late August survey might completely miss this important and often fragile resource. Finally, when compiling your vegetation maps, be cautious about drawing attention to rare or sensitive species that might be damaged by excessive trampling or picking.

FISHERIES AND WILDLIFE

The purpose of this inventory is to identify the species of fish and wildlife that inhabit or visit your study area, along with their habitat requirements. Particular attention should be given to those species listed as rare, threatened, and endangered. Learning about the fish and wildlife species representative of your area will enable you to help protect them by maintaining and linking habitat



Great Blue Heron.

areas and by steering clear of sensitive species. For more information, contact the Fisheries, Wildlife, and Habitat Information and Education Office or the Massachusetts Natural Heritage and Endangered Species Program, both within the Department of Fisheries, Wildlife and Environmental Law Enforcement (see Appendix B).

AREAS OF CRITICAL

ENVIRONMENTAL CONCERN
Areas of Critical Environmental Concern
(ACEC) contain a concentration of significant
environmental features, ranging from agricultural areas and old-growth forest to aquifer
recharge areas and estuarine wetlands. To be



Just a short distance off the Appalachian Trail in South Egremont, hikers enjoy a magnificent view of the valley from Jug End. One of the high points of the area, Jug End lies within the 7,000-acre Karner Brook Watershed Area of Critical Environmental Concern (ACEC). This ACEC includes some of the highest concentrations of rare species in the Commonwealth, exceptional natural communities, and 2,000 acres of public open space.

eligible for designation as an ACEC, an area must contain features from a minimum of four resource categories, such as rare species habitat, wetlands, or agricultural lands, and it must be of regional or statewide significance. ACECs are formally designated by the Massachusetts Secretary of Environmental Affairs following a public nomination and review process. This designation is aimed at enhancing and facilitating stewardship of these special sites and it directs state environmental agencies to follow a proactive agenda to preserve, restore, and enhance the resources of these areas. An ACEC designation complements local authority and zoning, and can help state, local, and private organizations work together to create an ecosystem-based framework for resource preservation and management. For more information on the locations and resource features of these areas. contact the ACEC program within DEM (see Appendix B).

CULTURAL AND HISTORIC RESOURCES

Cultural and historic resources vary greatly across the Commonwealth and can include almost any feature that is important to your community. Some examples are historic structures or landmarks, cemeteries, museums, canals, dams, town commons, and archeological resources. Identifying the location of these resources will help you determine how they relate to other landscape features and how they could be incorporated into your greenway. Including these treasures in your greenway can provide some protection and help ensure that they are accessible to citizens now and in the future. Sources for this type of information include the Massachu-

setts Historical Commission, local historical commissions or societies, site visits, and input from fellow citizens (see Appendix B).



This stone arch railroad bridge (ca. 1840) spanning the West Branch of the Westfield River in Chester is one of ten such structures listed on the National Register of Historic Places.

SCENIC AND SPECIAL LANDSCAPE FEATURES

Scenic vistas, farmland, hilltops, forestland, town commons, roads, and estate lands may be among the significant scenic resources in your study area. Locating and mapping these areas will help to identify the places that are unique to your study area and help you to determine what it is that makes them special. Very often these areas are where a number of resources overlap in particular ways or where people have had a particular influence on the natural landscape. While you may have already included some of these features in your inventory, it is important to recognize how the various resource types interact to create a special sense of place. For example, a scenic agricultural landscape might include farm fields, forestland, and streams crisscrossing throughout the area. To truly protect these special places, it is essential to look at the entire landscape and how it is being used, as well as at its individual components.

Given the individual nature of this category, the best source of information may well

be on-site explorations of your area. To supplement your own evaluations, consult DEM's Scenic Landscape Inventory (see Appendix A).

RECREATIONAL FACILITIES AND OPPORTUNITIES

Identifying existing recreational resources such as public parks, playing fields, trails, bike paths, swimming areas, schools, and other public facilities can play a key role in helping you determine potential locations for your greenway. This component of your inventory should also indicate opportunities for recreational use such as abandoned railroad and utility rights-of-way, stream corridors, old summer camps, and privately-owned open spaces and recreational areas such as golf courses. Many of these areas may already be used informally by the public and this should also be noted. A landowner already accustomed to some public use of his or her land may be more inclined to formalize these rights than one who has no experience with public use.

As you gather recreation data, it is likely you will identify some areas already listed in



The thirteen-acre Wykowski Farm in Whately was protected through the DFA's Agricultural Preservation Restriction (APR) program. The farm has approximately three hundred feet of frontage on the Connecticut River and figures prominently in the view from the top of Mount Sugarloaf, as photographed here.



The Norwottuck Rail Trail between Amherst and Northampton is a popular destination for local residents and tourists alike.

your natural, cultural/historic, or scenic inventories. For example, many water resources provide excellent opportunities for swimming and fishing, and are also important habitat areas. Mapping resource and recreational information together can illustrate where they overlap, help identify natural connections between resources, and point out where linkage is needed. Areas of multiple resource value are prime targets for inclusion in your greenway, although they may raise difficult management issues. For example, certain coastal areas may be ideal for recreation although human activity could potentially threaten shorebird nesting habitat. At this point in the process acknowledge these kinds of issues, but try not to let them inhibit your creativity.

In addition to identifying and mapping recreational resources, it is also useful to gather information on current use patterns, fees charged, accessibility, and maintenance of existing areas. This kind of data will help you evaluate existing opportunities and give you a general sense of community needs.

Remember, recreation means different things to different people, and as a result, the kinds of resources which represent recreational opportunities can vary greatly. Keeping your greenway vision in mind as you collect and consider recreation data will enable you to think creatively, make the best use of your time, and minimize the amount of extraneous information you gather. Finally, don't be discouraged if you can't identify many recreational resources. You may have discovered a very important reason for establishing a recreational greenway in your study area.

A WORD ON MAPS

Maps are an effective means of summarizing, storing, and graphically presenting resource and land-use data. Maps are also extremely useful educational tools; they can help raise and answer many questions, and serve as a focal point for discussion. By showing the extent and location of a variety of resources on a single sheet, maps help people visualize the elements that comprise the landscape and the unique character of an area.

At this stage, any maps you produce should be working documents to give you and your community a better understanding of the study area. They need not be fancy or perfectly accurate, and can be produced manually by members of your project group. It is usually wise to avoid producing an expensive, definitive-looking map indicating potential greenway locations before you speak with landowners. Someone may be completely sold on the greenway idea until they see a map showing it going through their backyard. While maps can help people understand the greenway concept and ultimately promote the project, they can also backfire if they come as a surprise or appear too final too early in the process. The key to this issue is timing and you will have to use your judgement and knowledge of your community to determine when to go public with a detailed map.

MAPPING: ENDS & MEANS

WHY A MAP?

Greenways and trails have a basic reliance on maps. Even a simple map can answer such logical questions as, Where does this pathway end up? How far is it from one access point to the next? or Where are the scenic viewpoints?

Mapping can also be a beneficial component of your resource analysis. Having a visual image of where the various resources lie will help in making sound greenway planning and design decisions. Almost every piece of information collected during your inventory phase has a spatial or locational component to it; organizing this data in map form can help make it more understandable and show interrelationships or concentrations of resources not previously evident.

THE OVERLAY APPROACH

There are two basic approaches to

preparing maps: manual and computer-assisted. The latter includes geographic information systems (GIS). Both types of mapping rely on the concept of overlays. Popularized in the 1960s by landscape architect lan McHara, the principle behind overlay mapping is to separate the environment into component parts (e.g., water resources, vegetation, protected open space, cultural features, etc.) and to map each resource type separately but at the same scale. Simply laying maps at different scales side by side makes it difficult to visualize how the

resources work together. On the other hand, trying to make a single map that shows everything of importance can result in a map that is too complicated to be meaninaful.

The alternative is to create a base map and a series of overlays which can be used together. This allows the user to view the data one layer at a time or in any combination with other resources. If the overlays are drawn or printed on translucent material, they can be combined in different combinations to identify areas of particuuse in 1970 may be combined with an overlay of current land use to show where the greatest concentration of change has occurred. This, in turn, might be combined ued pattern of development might threaten local farmland. Alter-

lar sensitivity or importance. For example, an overlay showing land with an overlay of prime agricultural soils to reveal how this contin-

OVERLAY CONCEPT Hydrology

A series of "overlay" maps illustrate a variety of landscape features. When used together, these maps can help guide greenway planning and other land use decisions.

nately, a map showing trong solve overlaid with one showing the locations of streams and wet ands and one indicating protected open space, can help in identifying feasible options for trail routes.

PRODUCING MAPS BY HAND

Producing maps and overlays by hand begins with preparation of a base map. Because every other map will be placed over the base map, it should include fixed features that provide geographic reference points to the viewer. The best source of data for base maps is usually USGS topographic maps, which clearly indicate roads, streams and ponds, political boundaries, and a coordinate reference arid. One method of creating a base map is to patch together the appropriate USGS topographic quads and to reduce or adjust them to the desired size at a copy

> shop or reprographics center. This map can be printed onto a durable, translucent paper such as vellum or mylar, from which paper copies can be made.

Additional data you've collected in map form, such as protected open space, wetlands, or existing trails, can be adjusted to the same size. You can then transfer this information onto separate clear mylar sheets and overlay them, singularly or in groups, on the paper base map. This technique is a fairly simple and economical way of producing a useful set of maps that enable you to look at several types of information at once. Remember, however,

that if you plan to make copies of your base or working maps, color does not reproduce well. In this case, consider using patterns or cross-hatching to show your resource information.

For more specifics on mapping techniques, consult the Manual of Build-out Analysis produced by the Center for Rural Massachusetts, the Open Space Planner's Workbook developed cooperatively by DEM and the Division of Conservation Services, and the Adopt-a-Stream Workbook prepared by the Department of Fisheries, Wildlife and Environmental Law Enforcement (see Appendix A).

WHAT IS GIS?

The same basic principles described above apply to a GISgenerated map. Geographic information systems are computer programs that can produce maps, can store descriptive information about resources shown on maps, and can measure, count, compare, and perform other complicated analyses on the data. Because it can perform these complicated analytical functions, GIS is more than just a map in a computer. For example, GIS can be used not only to produce a map showing long distance trails, water resources, and protected open space, but it can also answer questions such as how many miles of trail are on protected lands, how far between access points, or how far is the trail from particular wetland areas or streams. This capacity to analyze and answer questions about the data often entails combining information from different sources and sets GIS apart from related spatial analysis software such as computeraided design and drafting (CADD) and automated mapping and facilities management (AM/FM).

analyses because it is made up of two parts: a database that describes information (e.g., location, name, ownership, length, area, etc.); and a graphic element which displays this information as a map, table, chart, or some other kind of diagram. These data are divided into layers of information: roads may be one layer, protected open space another, hydrology another, etc.; each of these layers can be mapped alone or in combination with different layers.

Recreating a typical USGS topo map in a GIS would require utilizing many layers of information: topographic contours, roads, streams, lakes and ponds, state or local land boundaries, wetlands, railroads, existing development, etc. However, where a standard USGS map is only a "picture" of the features, the GIS system would be able to analyze the data and provide answers to questions like: how steep are the slopes, how far are the wetlands from developed areas, how many miles of riverfront land are permanently protected, etc. Once you enter your proposed greenway corridor and other critical information into a GIS, you can find out how many acres of wetlands or critical habitat are included in the area, how many endangered species would be protected (or threatened), or how many people live within fifteen miles of particular state forests and other recreational facilities.

WHAT IS MASSGIS?

The geographic information system developed by the Massachusetts Executive Office of Environmental Affairs (EOEA) is called MassGIS. It is located within the Environmental Data Center, where GIS specialists maintain and work with a large body of information about the natural resources of Massachusetts;

protected open space, land use, town boundaries, drainage basins, aquifers, public water supplies, and census data are just a sample of the information in the EOEA computer system. They also perform spatial data analysis and development to support GIS users in all of EOEA's agencies. The information maintained by MassGIS is gathered from many sources, including existing maps, aerial photographs, and public and private records. MassGIS acts as a central repository for data of statewide significance. It also works cooperatively with several of the Regional Planning Agencies (RPAs) which have GIS programs.

MassGIS is in the process of working with volunteers across the state to add locally-protected lands to the open space data layer. Each municipality that participates in this program receives free paper maps showing the various resources that are currently part of the MassGIS data base, including features such as landfills, wells, aquifers, wetlands, etc., in return for the open space data supplied by the volunteer. If you are interested in learning more about this program, contact MassGIS at (617) 727-5227, ext. 306.

DOES MASSGIS OFFER ANY SERVICES TO THE PUBLIC?

Through MassGIS, the Commonwealth has created a coordinated, statewide database of spatial information for environmental planning and management. MassGIS sells its digital data and copies of resource maps. As noted above, the charge for maps is waived in certain cases. The fee for data can also be waived in exchange for digital data of use to MassGIS. For more information contact MassGIS at (617) 727-5227, ext. 322.

ARE THERE OTHER SOURCES OF GIS ASSISTANCE FOR THE PUBLIC?

A number of Regional Planning Agencies (RPAs) now have the capability to perform many of the same functions as Mass-GIS, but with more of an emphasis on resources of regional and local significance. See Appendix B for a list of RPAs in Massachusetts. In addition, there are consulting firms and other private companies that specialize in

providing the same sort of information and assistance. Consult your local telephone directory or RPA office for suggestions and referrals.

GIS AND TRADITION MAPS: WHICH ROUTE TO CHOOSE?

Determining whether to produce maps manually, to invest in your own GIS equipment and do it yourself, or to hire out the production of GIS maps is an individual decision which will involve weighing your needs with the cost, time, and necessary expertise associated with



The Bay Circuit Alliance used GIS as a planning tool to identify key areas that need to be protected. This map shows existing and proposed trail segments, trail gaps, and the status of the land along the corridor. From Protection Plan for the Bay Circuit Trail and Greenway, 1995.

each option. Learning how to produce traditional, hand-drawn maps is not too difficult and requires minimal expenditures for supplies. Creating each resource (data) layer can, however, be very time consuming, and making changes often means having to start over. Developing an in-house GIS system requires the up-front purchase of expensive equipment and has a steep learning curve. While creating a resource data layer in GIS can be quite time-consuming, making changes to the data or the map is usually a fairly simple procedure

o due ba an a a sell re o me le expens e, however, making olanges to the data or having additional copies of maps produced is usually not too difficult or costly.

Whichever route you choose, the bottom line remains the same — a map is only as accurate as the database from which it was created. This is as true for handdrawn maps as it is for the most sophisticated GIS graphics. Just as hand-drawn maps should be based on the most current information available, new data and land use changes must be reflected in the GIS database to give an accurate picture when mapped. Regardless of the accuracy of the data, GIS maps tend to look very professional and impressive,

The fact that maps can spark controversy should not deter you from producing a set of working resource maps. They will be invaluable in helping to summarize and present your data for discussion. Maps can also help you visualize potential corridors and identify the issues associated with the various options being considered. Although they

may raise questions and concerns, it is better to uncover and address these issues as early in the process as possible, before a certain corridor or set of features is fixed in people's minds. And don't forget — maps can also suggest possible resolutions to some of the issues they raise.

reinforcing the natural tendency to give more credence to anything produced by a computer. It is important to remember that while they may look more polished, GIS maps aren't always more accurate than hand-drawn maps.

Nonetheless, GIS is viewed by some as having distinct advantages over manually-produced maps. The graphic and analytical components of GIS are powerful planning tools. While many GIS maps may not be 100 percent accurate, they are ideal for resource analysis and are an effective means of presenting ideas and information to the public. Once data is entered into the system, several versions of the map can be printed at any scale desired. This is often extremely useful since a small map may be appropriate for written reports while a large display map may make all the difference in enhancing a public presentation. New information added to the database can easily be incorporated into future maps, eliminating the need to redraft maps by hand each time changes occur.

In addition, if a central GIS facility is used, it provides a core repository for mapped information — a convenient and accessible library. This eliminates the need to make dozens of phone calls to

track down information and avoids duplicating the work of others. This access to data, be it for a simple or multi-layered map, is one of the greatest advantages of working through a central data center like an RPA, a university-based facility or MassGIS. It also ensures that the data will be uniform since all users have access to the same information.

There are, therefore, pros and cons for both GIS and manuallydrawn maps and the deciding factor is often cost. GIS maps can be produced in many formats, enabling you to thoroughly and efficiently analyze the data. In addition, they are flexible and can accommodate change more easily than traditional or hand-drawn maps. However, it is unlikely that all the data you will want or have uncovered is available on GIS at this time. Including this information on a map would require significant data entry which can be complex and time consuming. Unless you have direct access to GIS and the expertise needed to enter and manipulate data, it is likely that your set of resource maps will be a combination of computer-generated and hand-drawn graphics. You may choose to purchase or produce some basic GIS maps and to supplement them with more specific hand-drawn

maps which include additional data you've collected. While it takes a fair amount of equipment and experience to use GIS, anybody with a little bit of patience, the necessary information, and some basic supplies can create a useful resource map. Conceptual sketch maps of your proposed project can also be drawn by hand. Overall, manually-prepared maps tend to look less definitive than GIS maps, and can be useful in preliminary meetings where you want to present and discuss your ideas. And then there are those who swear that only through an activity such as mapping does one become familiar enough with an area and its resources to develop an innate sense of how a greenway can best protect and connect all its varied features.

This summary is based on documents prepared by the MassGIS office, EOEA's Open Space Planner's Workbook (1993), and an article by Laura Rosenzweig, "Greenway and Trail Mapping (and more) with GIS" which appeared in the Fall 1995 issue of Viewpoints: The Massachusetts Greenway and Trail Forum.

For more information on acquiring data or maps from MassGIS, call (617) 727-5227, ext. 322.

LOOKING AT LAND OWNERSHIP AND LAND USE

The next step in the inventory process is to consider your study area in terms of land ownership and use. Information on land

ownership illustrates how land is subdivided and can be extremely useful in developing a realistic protection strategy for your proposed greenway. Knowing whether an area you hope to include in your greenway belongs to one, two, or multiple landowners, and how that land is being used, will help you determine the most effective and feasible means of



Cricket Creek Farm, Williamstown.

securing or gaining access to the land. Most of this information is available in map form at the local Assessor's Office, but it will require piecing together the appropriate parcel maps and then cross-referencing them with ownership lists. The local land use or zoning map may also provide useful information.

One key component of your land use analysis is the identification of protected and unprotected open spaces. These can include publicly-owned parcels, tracts held by land trusts, conservation organizations and institutions, large private holdings, vacant land, and land subject to conservation and agricultural preservation restrictions. It is important to remember that not all public land is permanently protected. For example, a town may decide to sell one or more of its public school properties for redevelopment into office space, condominiums, or elderly housing. Similarly, parcels that appear to be protected, such as tracts in use value taxation programs (e.g., Chapter 61 or 61A, see Appendix D) or private areas that have been used as "public" open space for years, could potentially be developed. It is essential, therefore, to determine which parcels are protected in perpetuity, which are subject to temporary measures, and which are not protected at all. This type of information may be available from your local Assessor's Office, Planning Board, or Conservation Commission, or from your town's Open

Space Plan. You may also wish to consult the Division of Conservation Services within EOEA for information on conservation restrictions (see Appendix B).

As part of your inventory and analysis, consider the open space and recreational resources you've identified in the context of recent land use patterns and trends. What type of development has occurred in or near your proposed corridor over the past few months or years? How will this trend affect existing open space and recreational resources? Will there be an increased demand for recreational opportunities in the foreseeable future? It is also useful to identify the developed lands in and around your study area, and to determine how the undeveloped areas are zoned. Existing and proposed land uses that could have adverse impacts on the resource base, such as gravel mining, landfills, large subdivisions, and highway expansions should also be considered. Although it may not be feasible to do a parcelby-parcel analysis of this larger area, a broadbrush survey will help you develop a better understanding of how your project site fits into and interacts with the surrounding landscape.

USGS topographical maps show existing buildings along with rail lines, industrial areas, gravel pits, landfills, etc. You should, however, check the date the map was prepared. In some cases these maps are ten to fifteen years old and considerable new building may have occurred during that period. Your local Planning Board or Regional Planning Agency should be able to provide you with current zoning and land use maps. Aerial photos are also a good source for this type of information.

Reviewing land use and ownership patterns in and around your study area will help identify opportunities as well as uncover issues that need to be addressed. Working through these issues, and weighing threats and conflicts with opportunities and needs, will help you further define the nature and location of your proposed greenway.

CONSIDERING LAND USE REGULATIONS AND PROGRAMS

The last major element of your inventory involves looking at the variety of land use and environmental regulations at work within and around your study area. This information will enable you to determine the ways in which land may be utilized and protected.

ZONING BYLAWS

A good place to begin is with the zoning bylaw(s) of the community(ies) involved. In general, zoning regulates the nature, distribution, and intensity of development permitted within a municipality. The complexity and scope of these regulations vary significantly throughout the Commonwealth. In addition to basic density and use requirements, some communities have incorporated innovative provisions into their bylaws in an attempt to guide growth to the most appropriate areas and to minimize the impacts of development on natural resources. The more common of these techniques include overlay zoning (which provides added protection for sensitive areas), open space zoning, and site plan review. If your community has one or more of these or other innovative mechanisms in place, it is important to determine to which areas they apply, how and if they are being utilized, and the level of protection they provide. For more information about regulatory land protection techniques, consult the Growth Management Workbook, available through the Pioneer Valley Planning Commission (see Appendix A).

SUBDIVISION REGULATIONS

Local subdivision control regulations detail the process for subdividing a large piece of land into multiple parcels. These regulations may apply to both residential subdivisions and to nonresidential subdivisions, such as office or industrial parks. In addition to meeting lot size and setback requirements specified in the zoning bylaws, a developer must adhere to requirements set forth in the subdivision regulations. These might include erosion control measures, utility and drainage requirements, open space set asides, and a variety of design standards for streets such as width, length, surface material, maximum gradients, and sidewalk and bikepath requirements. As with zoning bylaws, the complexity and detail of subdivision regulations vary tremendously among communities. It is important to determine if the subdivision regulations in place in your study area include any provisions such as open space set asides or trail easement requirements which could potentially benefit or impact your greenway initiative. If they do not, you might contact the planning board and explore how these types of provisions may be incorporated in the future. Working hand-in-hand with town boards and developers can be an effective, low-cost way to help implement your greenway project.



Kathy Sfe

This trail in Yarmouth was an ancient cart path that had been used informally as a recreational path by local residents. This right-of-way was preserved when the King's Way condominium development was created on adjacent land.

ENVIRONMENTAL REGULATIONS AND PROGRAMS

Board of Health regulations provide another set of standards that help protect resources at the local level. These regulations are administrative rules established in each community to guide the construction and maintenance of wells and septic systems, and are geared primarily toward protecting public health and safety. At a minimum, local Boards of Health enforce the regulations set forth by DEP in The State Environmental Code Title V: Standard Requirements for the Siting, Construction, Inspection, Upgrade, and Expansion of On-Site Sewage Treatment and Disposal Systems and for the Transport and Disposal of Septage (310CRM-15). However, local Boards of Health also have broad authority to establish more stringent guidelines which may be relevant to natural resource protection. Again, it is useful to know the regulations in place in your community and how they are being enforced.

In addition to local regulations, it is important to identify state laws and programs that could potentially protect significant resources in your study area. These include: the Scenic Mountains, Wetlands Protection (including Rivers Protection), Coastal Zone Management, and Endangered Species Acts; and the Wetlands Conservancy, Areas of Critical Environmental Concern, Agricultural

Preservation Restriction, and preferential taxation (Chapter 61, 61A, and 61B) programs. See Appendix D for more information on the Commonwealth's land and resource protection programs and laws.

After learning about the

After learning about the different types of regulations and programs in place, you will need to determine whether they

adequately address resource protec-

tion needs, and identify gaps in existing protection mechanisms. Complementing regulations with proactive initiatives can greatly increase their overall effectiveness. In general, proactive or voluntary efforts are more flexible and can be tailored to site specific resource protection needs. In addition, they usually require the support of the landowners involved, and can often provide more permanent solutions.

PUTTING IT TOGETHER: SOME IMPORTANT QUESTIONS

As you continue to evaluate and synthesize the information you've collected, you will gain a better understanding of the resource base and how it is impacted by present and potential land uses. While it is likely that you've been considering the implications of your findings throughout the inventory phase, it is essential to systematically consider your data in terms of resource protection and recreational needs, community priorities, and the hopes and intentions of your greenway group. This will help you set the goals and objectives for your greenway project. The following is a list of discussion questions to guide your analysis, and to help you consider the implications of what you've discovered. As always, tailor this list to your project by focusing on those questions and issues most relevant to your study area and by adding your own ideas.

- What is it about your community or study area that makes it special?
- What areas do community members value most?
- What are the most pressing resource protection needs?

- What are the most critical resources or resource areas?
- Which areas are threatened how and how soon?
- What are the most pressing recreational needs?
- Are recreational needs and demands being met?
- What are the most pressing community needs and concerns?
- What are some conflicts between existing land uses?
- What are the current land and recreational use patterns within your study area?
- What are some economic and political considerations around this and other resource protection initiatives?
- Are there any potential conflicts within your greenway group?
- Has there been any opposition to your initiative to date? If so, around what issues and do you now have information to effectively address them?
- Do existing mechanisms (regulatory and nonregulatory) protect important resources? To what extent?
- Where are the gaps in existing protection mechanisms?
- How might a greenway address these issues?

These and other questions should be discussed and answered within your greenway group, as well as with citizens at large, landowners within the proposed project area, local conservation groups, and various municipal boards. It is essential to return to community members to present your findings, to learn

what they feel is most important, and to gauge what they are willing to do to achieve these ideals. These discussions, along with the actual data, should be considered as you articulate the goals and objectives of your proposed greenway initiative.

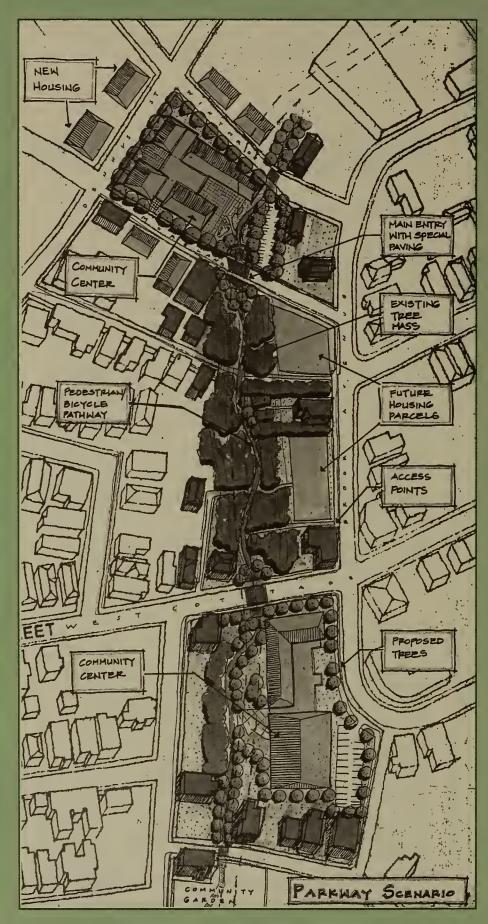
GOALS AND OBJECTIVES

neveloping a clear set of goals and objectives to guide your greenway initiative is a critical step in the greenway planning process. Your project goals should be a series of ideals that you hope to achieve by creating a greenway. Goals are more specific than the overall project vision in that they are informed by all the work you have done so far, and correspond to specific issues. The fact that the goals you develop are supported by your inventory and analysis should not, however, stifle your creativity. This remains a time of imagination. At this point you may also wish to revisit the vision statement you articulated earlier to ensure that it still accurately represents what you hope to accomplish.

Objectives are more specific than goals and should reflect particular ideas for achieving the goal to which they apply. It is common to have several objectives relative to a particular goal, each reflecting a different approach to achieving the broader ideal. When articulating goals and objectives, it is important to remember that goals are general concepts, objectives are specific ideas for achieving the goals, and action steps (discussed in Chapter 5) are particular activities which, if carried out, would advance the objectives.

Writing a clear set of goals and objectives can be difficult. It is essential to be patient and to spend the time you need to ensure that your project goals and objectives are realistic and accurately reflect what you hope to achieve. The extra time and effort required to consider all your information and

GOALS & OBJECTIVES



This design for a greenway linking community centers and open spaces in Roxbury's Dudley Street neighborhood was the result of a community-based planning process led by the Dudley Street Neighborhood Initiative (DSNI). Some of the goals that the group set for their greenway project are listed above.

GREENWAY GOALS

- 1. Establish a safe and attractive community greenway linking proposed community centers.
- 2. Incorporate and preserve existing natural features such as land form and tree mass into a greenway.
- 3. Integrate adjacent developable parcels into a greenway.
- 4. Expand open space linkages in the Dudley Street Neighborhood Initiative area.

SAMPLE OBJECTIVES

After setting goals, it is useful to write objectives articulating more specific ideas for achieving each goal. Below are some sample objectives that correspond to DSNI's goals. (Note: these are not actual objectives written by the Dudley Street Neighborhood Initiative).

- 1a. Hold public meetings to gather citizen input for greenway location and design.
- 1b. Explore funding options for planning efforts and initial design.
- 2a. Conduct an inventory and map natural features in proposed greenway corridor.
- 2b. Research ownership and level of protection of natural features, and determine feasibility of including them in greenway design.
- 3a. Inventory developable parcels and relevant ownership information.
- 3b. Work with city boards and adjacent landowners to maintain a natural buffer between future development and the proposed greenway.
- 3c. Work with city housing and planning board to build in links between the greenway and future development.
- 4a. Research location, ownership, and protection status of open space parcels in the DSNI area.
- 4b. Identify gaps between proposed greenway and nearby open spaces, and develop a strategy for securing key parcels to create linkages.
- 4c. Incorporate open space connections in greenway design.

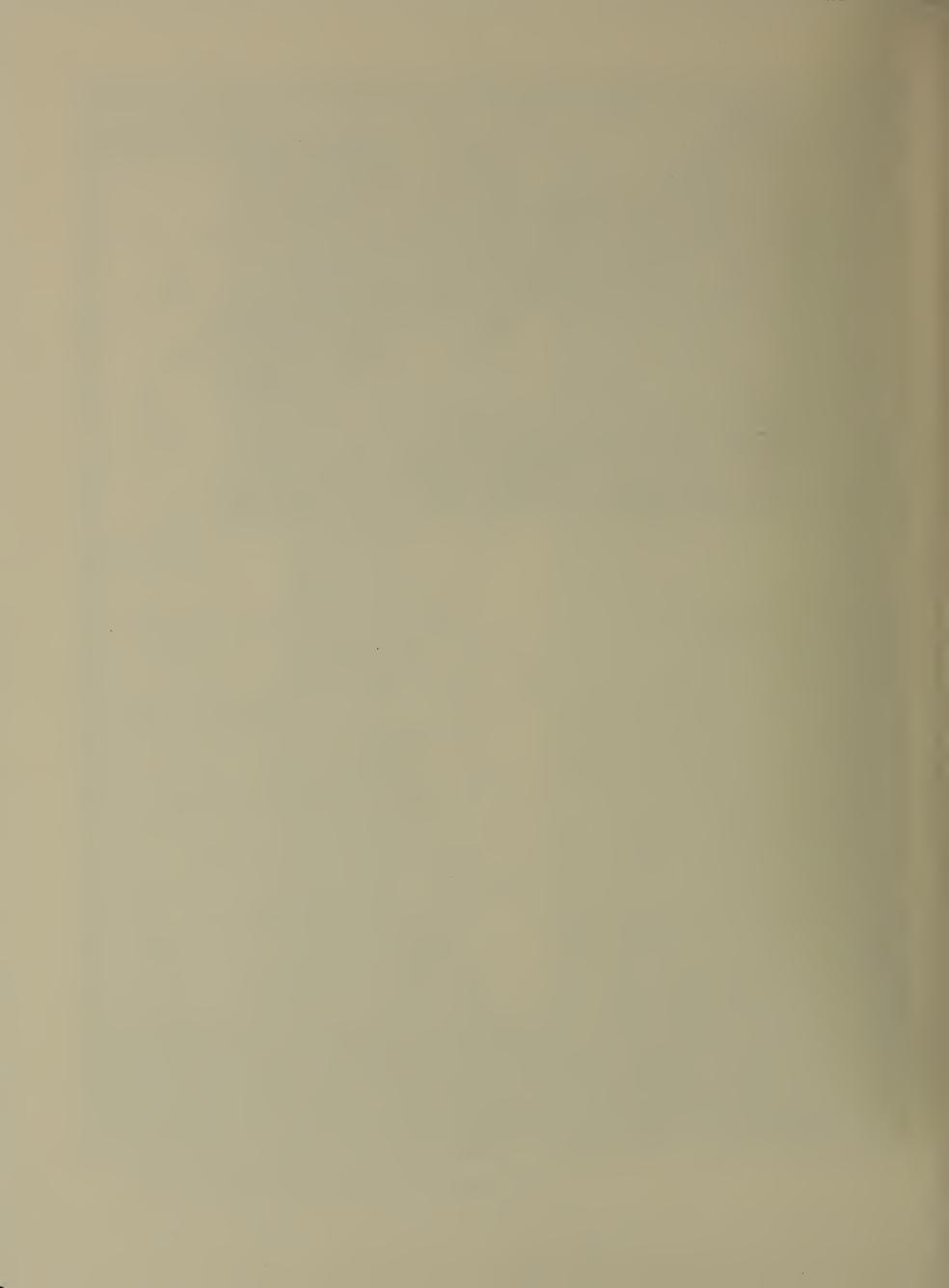


Boy fishing on Shawsheen River

to maintain a dialogue with the public will pay off during the implementation phase of the project and will help keep your project on track. You must remember, however, that while greenways can do a lot, they cannot solve all resource management problems. As you set your goals, it is important to be realistic and to try to strike a balance between the visionary and the pragmatic.

Once you and the community are satisfied with the greenway goals, it is helpful to put them in order of priority. This entails weighing a variety of issues including community needs, the integrity of the resource base, and the political climate. It isn't necessary to determine an exact order, but rather to decide which goals are of primary importance and which are secondary. This will focus your efforts and help to determine potential locations for, or the sequence for developing, the proposed greenway. Later in the process, this hierarchy will guide you in targeting sections for completion in the first phases of implementation.

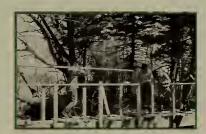
The last step before you begin to develop an implementation strategy is to identify and map potential areas to be included in your proposed greenway. Your resource inventories, fieldwork, community meetings, and project goals and objectives will likely reveal a number of greenway possibilities. While an exact alignment must be determined at some point, the purpose of this map is public education and outreach, and it is vital to remain flexible. Flexibility will enable you to work with landowners to determine the most desirable location, and it will prevent the situation of one particular parcel compromising the entire project. Again, the appropriate level of detail and the issue of when to go public with your greenway map will depend on the nature of the project, the level of community support, and other factors unique to your effort. The best advice is just to use your judgment, but to err on the side caution.



Chapter Five

IMPLEMENTATION

Making Your Greenway a Reality



nce you've decided on the nature and approximate location of your proposed greenway, it is time to determine the most effective means of making it happen on the ground. The steps in this process will vary significantly among greenway projects and will be shaped by the particular circumstances and individuals associated with your initiative. Implementing a greenway means protecting and connecting the resources within the proposed corridor and obtaining the funds required to do so. These seemingly straightforward tasks can become complex when the variety of resources and alternatives for protecting them are considered in the context of private property rights and political realities. To keep your efforts on track, it is helpful to first chart your course of action. As you develop your strategy, remember that implementing a greenway is very much a public process that requires the involvement and continued support of citizens and community leaders.

This chapter outlines some of the basic steps in the implementation process. It is meant to generate ideas and to provide the information you'll need to get started. Think of these guidelines as a framework you can modify to develop the most effective imple-

mentation strategy for your greenway. Every situation is different, so think creatively, remain flexible, and be patient.

DEVELOPING YOUR IMPLEMENTATION STRATEGY

TARGETING A PILOT PROJECT

One of the first steps in the implementation process is to decide which stretch(es) of the proposed corridor to target first. This is particularly helpful if you are working on a large greenway project. If you consider your greenway in sections, implementation then becomes a series of smaller projects that occur in a particular order, with each step bringing you closer to achieving your overall greenway goals. There are several advantages to this approach. Focusing on "do-able" projects makes implementation more tangible and prevents those involved from being overwhelmed by the prospect of attempting to protect the entire corridor at once. In addition, completing smaller projects enables you to measure and publicize your successes. These milestones are inspiring not only for greenway advocates, but for the uninitiated as well. Pilot projects become living proof that creating a greenway is possible, and they illustrate the benefits it will provide.

Your priority goals and objectives, resource maps, and inventory data will help you target pilot projects. Your initial effort should be feasible, visible, and clearly illustrate the positive impacts and potential of greenways. Other factors such as threats, feasibility, and popularity must also be taken into consideration. If, for example, an important area is facing imminent degradation, it may be wise to begin there even if it is not the most critical section of the greenway. Similarly, if securing the most important area is simply not possible at this point in time, it may be in your best interest to hold off on pursuing it. Finally, it is always a good idea

Pilot projects become living proof that creating a greenway is possible, and they illustrate the benefits it will provide.

to kick off your initiative with a project that is both manageable and popular. The less opposition you encounter early on, the more successful you will be in implementing the greenway project and promoting its benefits.

As you identify areas to target, begin to formulate an overall game plan into which these pilot projects fit. This will provide a context for the smaller activities and will

prevent you from losing sight of the big picture. Your general framework, along with the specifics of the pilot projects, will become the basis for a detailed implementation strategy.

TOOLS FOR IMPLEMENTATION

Once you've targeted one or two pilot areas, consider how best to secure them. First, you'll need to look at the area parcel by parcel to determine current use and ownership, level of protection (if any), and how the resources are dispersed relative to property boundaries. This information will suggest what kind of protection and access you will need for each parcel in order to achieve your project goals. Additional factors to consider in choosing the most appropriate land and resource protection methods are what you intend to accomplish, the degree of control that will be needed over a particular parcel, potential future use(s), development threats, available funding, and the needs and wishes of the landowner(s), which will play a critical role in determining how and when to proceed. To keep track of all these factors, it is helpful to develop a matrix or table which includes the parcels under consideration and the relevant factors for each.

When it comes to strategizing about land protection techniques, the first method that often comes to mind is outright or fee simple purchase. Given today's market and the many parcels and landowners often involved in greenway projects, this is rarely a feasible option for the entire corridor. Securing a greenway usually requires a variety of land protection and conservation tools, which can range from informal agreements made at will to legally binding restrictions recorded at the Registry of Deeds. These include securing easements, obtaining conservation restrictions, negotiating public access, soliciting donations of land, working with land trusts, participating in statewide

conservation programs, and adopting certain zoning regulations (such as creation of greenway overlay districts). All of these techniques are voluntary and, with the exception of regulations, can be applied on a case-by-case basis. This variety allows

for a great



DEM and the Williamstown Rural Lands Foundation (WRLF) work in partnership to protect lands along the Taconic Crest Trail. Land trusts can also play an important role in maintaining greenways and educating users about them. In this photo, young volunteers join the WRLF's ridge runner in maintaining a section of the Taconic Crest Trail while learning about basic trail maintenance.

deal of flexibility and enables you to tailor protection strategies to specific parcels or sections of your greenway.

Land trusts and other nonprofit conservation organizations can play an invaluable role in helping your group develop and implement an effective protection strategy. Many land trusts have extensive experience in landowner negotiations and are familiar with the tax benefits often associated with bargain sales and donating land or easements. They can also help answer landowners' questions about the variety of conservation options available, and assist in drafting easements and other essential documents. See Appendix E for a discussion of voluntary land and resource protection techniques; Appendix F contains a list of land trusts in Massachusetts.

As you work toward securing particular sections of your greenway, remember that no one technique will provide all the answers. Most likely you will need to utilize several land protection tools in concert to achieve

your specific conservation and recreation objectives. Think creatively and try combining various elements from different protection methods to create strategies tailored to your greenway project. However, if you intend to use unproven techniques, it is wise to

verify their legality with an attorney before proceeding.

DEVELOPING AN IMPLEMENTATION STRATEGY

The essence of an implementation strategy is determining which land protection techniques will be most effective for each section of the greenway, and then deciding when and how to proceed. It is important to make these decisions for the entire corridor and to commit them to writing. This written strategy should include a fairly detailed description of what you hope to achieve and how you plan to achieve it at both the parcel and the corridor levels. Estimates of the funds necessary to carry out these tasks should also be included. A good map of your greenway is another critical element of the implementation strategy. At the very least, it should show the general location of the overall greenway in the context of the larger landscape. A more detailed map

may highlight your proposed pilot project(s), areas already protected, important resources, critical parcels, and areas you intend to link together. This map will become one of the basic tools for presenting your project vision and goals. Again, you will have to use your judgement on the level of detail you feel is appropriate for different audiences at different points in the process.

There are several benefits to writing a brief implementation plan. A written strategy will guide your efforts, help keep your group

focused, and enable you to make sure tasks are carried out as planned. In addition, the strategy document can be used to publicize your initiative and to leverage funding from both public and private sources. Segments of the text can also be used for brochures, press releases, and grant proposals. Regardless of how you decide to use your written strategy, bear in mind that although written, it is by no means set in stone. If it is truly representative of your efforts, it will continue to evolve as opportunities and problems become apparent throughout the process.

As you develop your strategy, remember that others have traveled the same path before you. If you aren't sure

if something will work, contact fellow greenway advocates to see if they've ever tried it. Working with other groups and learning from their experiences will increase your effectiveness, save time and money, and enable you to do the best job possible. See Appendix G for a sampling of greenway projects in Massachusetts supported through DEM's Greenways and Trails Demonstration Grants Program.

WORKING WITH LANDOWNERS

It is wise to begin a dialogue with the owners of properties you hope to include in your greenway as soon as you are confident in your greenway plan. It is helpful to start with the easiest and most accessible properties first. These might include existing parks and protected open spaces, tracts owned by conservation organizations, and parcels owned by supportive landowners. Securing these "easy"

parcels first will enable you to get success stories on the map right away at little or no cost. The tools for incorporating these properties in your greenway may also differ from those you'll need for more difficult properties; including a town park, for example, may involve more of a formal endorsement than actual negotiation. Alternately, discussions with supportive landowners may entail working out mutuallybeneficial financial arrangements addressing concerns over landowner liability. Finally, it may be necessary to fine tune existing restrictions and access policies on certain protected properties to ensure their consistency with your greenway goals and

objectives. Regardless of the specific details involved, these initial parcels will become the cornerstones that you can build on and link together as you work to protect the entire greenway.

After an initial effort to protect these low-cost or "easy" parcels, you will need to start negotiating with individual property owners who may or may not be interested in



your greenway initiative. Approaching these people early in the process is important. It is critical, however, to be prepared and well-informed. When contacting landowners, treat them with respect and make every effort to incorporate them in the process. If they begin to feel some ownership of the greenway project, and believe that they are an integral part of its success, they may be more willing to negotiate. It is often helpful to enlist a landowner supportive of the greenway to accompany you in meeting with his or her neighbors. The first landowner may inspire the second by describing the benefits that motivated him or her to participate. If you

run into opposition, remember that private property rights are highly respected and guarded in the United States, and that we have little experience with common landownership or greenbelts as are found in England and other European countries. Asking people to forfeit or share some of these rights can be quite threatening. It is essential to recognize this at the beginning, respect landowners' concerns, and make it clear that you are not there to condemn their land or to force a deal. A frank approach will help you build trust and enable you to begin discussions from a point of mutual understanding.

KEYS TO SUCCESSFUL GREENWAY IMPLEMENTATION

Be persistent: An overall goal of any greenway project should be to increase public awareness and appreciation of important resources. This can only happen over time. Education, and in some instances changing long-held beliefs and practices, is a long, slow process. A steady consistent presence and a series of small gains and improvements is necessary.

Build strong local support: Any greenway project will ultimately come down to the effect on the local property owners. People from the community or locality will be more successful in accomplishing results and allaying fears and suspicions than someone from outside the locality. The most beneficial situation is when ideas about the greenway are generated from the locality itself.

Be willing to listen to local concerns and to make modifications as necessary: Approaching a greenway project with preconceived notions is a prescription for potential controversy and failure. Flexibility is necessary to respond to the many ideas and concerns generated.

Be up front and in the open: Suspicion is bred when landowners and residents believe that something has been sprung upon them, especially at the last moment. Scheduling meetings with municipal officials early in the process is useful.

Be respectful of personal property rights: Nothing is more important to people than their property. Plans or ideas which mention a specific use of a private property, without prior approval, should be avoided.

Work along many fronts: A greenway consists of many interrelated components, such as habitat protection, recreational access, land protection through zoning or easements, clean-ups, restoration, etc. Working along many fronts allows exposure and visibility to be maintained during times when some components may not be as active.

—Tom Matuszko, Pioneer Valley Planning Commission, Westfield River Greenway Plan



The Robert Frost Trail, a popular 40-mile hiking trail in Amherst and seven adjacent towns, crosses many privately owned parcels and has been created with the permission of these landowners. Signs are posted along the trail to inform trail users about property ownership and to promote proper trail use.

In addition to being humble, approaching landowners with respect, and attempting to make them feel a part of the initiative, there are several things you can do to help ensure that negotiations proceed as smoothly as possible. The following list of "tips" is based on the successes and failures of many land protection advocates.

DO YOUR HOMEWORK

Learn as much as possible about the property and be ready to explain why it is important to your project.

- Know what you are asking for and be prepared to walk away if you can't get it (ie. gift or purchase of an easement, permission to cross the land, etc.).
- Anticipate questions about condemnation, privacy, liability, vandalism, tax deductions, and options for selling the land in the future.

- Know who you expect your user group to be (e.g., pedestrians and joggers, bikers, skiers, motorized vehicles, etc.).
- Know how access limitations will be enforced (e.g., stiles, trailhead chains, locked gates, etc.).
- Know who will manage the portion of the corridor that crosses their land (e.g., volunteers, municipal workers, a land trust, etc.).
- Know what kind of maintenance is planned and how often it will be done (i.e., monthly, bi-annual, annual, etc.).

MEETING WITH A LANDOWNER

- Try to get introduced by a mutual acquaintance.
- Meet at the landowner's house; get to know them and let them get to know you.
- * Keep contacts simple, consistent, and straightforward.
- Be honest and be yourself—people don't give their land to entities, they give it to people they trust.
 - landowners
 excited
 about the
 project and
 make them
 feel special
 because
 they own
 something
 critical to
 its success.



- Bring the landowner copies of maps, photographs, and a packet of information to help explain the greenway project.
- Bring a neighbor who is participating in the project to help dispel fears and to answer questions.
- Don't pressure landowners—be flexible, listen to their concerns, and respect their worries.
- Always leave something unfinished so you can keep the process going.
- Be patient. The sale or gift of an easement can take years, and when you're assembling a group of easements or parcels ten years isn't unreasonable.
- Be prepared for the landowner to get cold feet. Planning a celebration right after the closing is sometimes helpful.
- Deals can and do fall through.

 Always have in mind another way to achieve your objectives.

As you begin to work with landowners, remember that they are probably a lot like you. Put yourself in their shoes and try to think up questions that you might have. Brainstorming with your steering committee or participating in role-playing activities are also effective ways to help prepare yourself for these meetings. If you do your homework, use common sense, and treat property owners with respect, you will have the best opportunity for success. Most people want to be generous to their neighbors and communities. Your job is to nurture those feelings and to help people feel empowered to act on them.

DESIGNING AND DEVELOPING YOUR GREENWAY

Up to this point, implementation has been discussed in terms of securing the land within the corridor. In addition to land protection, implementing a greenway usually entails designing and developing the corridor to some extent. As you're working on securing the resources, it is also important to determine the type and intensity of infrastructure that will be needed for each section of your greenway. These design considerations will reflect the goals and purpose behind establishing the greenway and who you expect the major user groups will be. Some questions to consider are listed below.

- If pathways are involved, what will their surface be (e.g., wood chips, gravel, packed dirt, etc.)?
- What areas, if any, will be paved? Will these areas be designed to accommodate wheelchairs?



ete Westove

Heavy equipment was brought in during initial construction of the eastern section of the Norwottuck Rail Trail in South Amherst. Extra planning and precautions were taken in areas such as this where wetlands bordered both sides of the trail corridor.

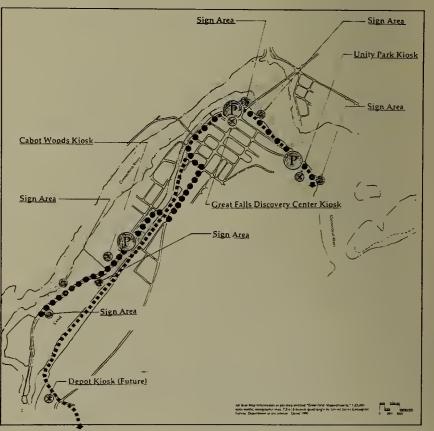
- Will there be benches, signs, or facilities along the way?
- Will trails need to be cut? If so, what will be the required width and depth of the trail bed and will these requirements vary with terrain and intended use?
- Do you hope to have interpretive signs or services?
- Will any areas require landscaping?
- Will parking areas be provided and which, if any, will be wheelchair-accessible?
- What features can be incorporated to accommodate physically challenged users?
- Has an ecological assessment been done to ensure that proposed infrastructure will not negatively impact soil stability or important plants or habitats?
- What sorts of buffers will be needed to help control erosion and sedimentation, to stabilize streambanks, or to provide adequate wildlife habitat?
- Are there any limitations due to slope or other natural features that should be considered in designing trails or other infrastructure?
- How can the greenway best accommodate different modes of travel and recreational use (e.g., bikers, skaters, walkers, etc.)?

Once you decide on the design and type of infrastructure needed, you should next develop a detailed map or plan of the proposed greenway to illustrate what it will look like when complete and to indicate the nature and location of various improvements.

Producing this plan will require a fair

amount of cartographic and design skill. If nobody in your group has that expertise, you may wish to hire a consultant, find a talented volunteer, or enlist the help of one or two interns from a nearby college or university (see Appendix H for sources of interns). If your greenway involves a great deal of construction, grading, paving, or planting, it would be wise to hire a professional engineer and/or landscape architect.

The maps and plans produced during this phase of the project will be quite detailed, showing several specific parcels within the greenway. The more polished the maps, the easier it is to think of them as the blueprints for implementation. It is essential, however, to remain flexible and to be ready and willing to adjust the alignment of the greenway in the event that one or two landowners change their minds. Remember that just because something is drawn in detail doesn't mean you can't change it to accommodate new opportunities or to alleviate problems.



Master plan for the Connecticut River ParkLink Corridor. Great Falls Discovery Center, Montague.

UNIVERSAL ACCESS

Technology changes at an astonishing rate and individual abilities vary so greatly that designers and land managers should no longer make assumptions of who will be able to get to and enjoy a particular recreation site.

—from Universal Access to Outdoor Recreation: A Design Guide

The term "universal access" refers to making an area or site barrier-free to people with disabilities. While this is not a new idea, passage of the Americans with Disabilities Act in 1991 gave recognition to accessibility as a civil right of all Americans. The concept of accessible design is based on the premise that at some point in their lives most people will experience some sort of temporary or permanent disability. Rather than being confined to different, "special" facilities, people with disabilities should have the opportunity to enjoy recreational pursuits with others, be they trails, waterways, bikepaths, or interpretive displays. With this in mind, consideration of access for a wide range of users should be incorporated into both the design principles and construction of your greenway project.

You can become part of the growing movement toward universal access by considering what simple steps can be taken to improve accessibility to your particular project. To be most

successful, accessibility should be built into the planning process at the earliest stages. When planning your greenway:

- take into account what types of recreation are already available in your area, and how much of it is accessible to people with disabilities;
- consider the spectrum of disabled users you are trying to reach, including those who are mobility impaired (such as the elderly or those confined to a wheelchair), visually impaired, or hearing impaired;
- strive to find design solutions that will accommodate as many of these users as possible. This might mean extending an accessible path to a

favorite fishing hole, providing adapted recreational equipment at parks, or lining path edges with fragrant flowers or tactile warning strips and installing braille trail markers to guide users with visual impairments.

It is also helpful to solicit the advice of someone with experience in accessibility and outdoor recreation. This person can identify opportunities for accessibility that might otherwise be missed and function as a catalyst for creative thinking.

Your approach to accessible site design should be comprehensive, including consideration of how information is given out, vehicle parking, pathways, fishing or boating access, restrooms, and



Ron Rantilla, designer of Frontrow Rowing Systems, demonstrates the use of an adaptive canoe from the wheelchair-accessible dock at Elwell Recreation Area in Northampton. Participants in this outdoor access fair had the opportunity to try out adaptive canoes and rowing shells.

picnic areas. For example, informational signs might include a clear indication of accessibility and facilities available for those who are mobility impaired, along with raised characters and pictographs for those who are visually impaired. Similarly, in designing pathways it is important to consider not only the width of the trail and the maximum allowable grade, but also surface type, ramp railings, installation of tactile warning strips at pathway edges, and adequate rest areas with seating. By taking a broad perspective of accessibility from the start, you are most likely to reach the needs of the greatest number of potential users.

In Massachusetts, Handcy the state's goal is to create accessible, representative examples of all types of recreation within any particular geographical area. The three programs highlighted below emphasize universal access in different ways but collectively move us closer toward making the Commonwealth's accessibility goals a reality.

VOLUNTEERS, ADAPTIVE EQUIPMENT AND PEOPLE

The "Welcome" sign outside Massachusetts state parks took on a heightened meaning when the Department of Environmental Management and the nonprofit group Outdoor Explorations (OE) held a series of outdoor access fairs across the state, called State Parks Unlimited: Celebrating Access for All. Outdoor Explorations is a Cambridge-based organization



Handcyclists enjoy the Norwottuck Rail Trail in Northampton.

which serves people both with and without disabilities. It seeks to build bridges between people of all abilities through shared outdoor experiences. Its twenty outdoor adventure trips and service projects per year focus on the basics, allowing everyone to participate. DEM and OE worked together to create this traveling festival, which offered everyone—regardless of ability—the opportunity to canoe, kayak, cycle, hike, play games, and work on trail projects.

Tom McCarthy, DEM's Access Coordinator and co-organizer of the fairs, had no reservations about the success of these events, noting that eighty people came out to the Pittsfield State Forest in the pouring rain. "In the past few years, DEM has doubled the number of fully accessible

parks. In addition to publicizing these facilities, we're taking the next step by purchasing handcycles for the parks, developing multi-sensory hikes, and developing an accessible rowing program on the Connecticut River in Northampton. Tapping into the energy and statewide contacts of Outdoor Explorations seemed like a natural combination of strengths." For OE's Director Carolyn Bess, the fairs provided an opportunity to demonstrate on a much larger scale the experience of its organization's adventure trips and service projects. "Our goal for the fairs was to feature the parks and what is available,

but in so doing we're really highlighting what we can do together," says Bess.

Both McCarthy and Bess agreed that while the events achieved the goal of showing how accessible the parks are, the real satisfaction lay in watching people of all abilities get together in the park and enjoy themselves. Bess related the story of one man who had been paralyzed from the waist down in an accident several years ago and who had never had the opportunity to go bicycling with his young children. "It's hard to describe the glow on this man's face when he came back from cycling with his kids. He loved the kayaking, but when he got on the handcycle, things really clicked....The real surprise came when we told him that the handcycles are available to the public."
DEM has purchased twelve handcycles (bicycles that can be pedaled by hand) and has them stationed at Wompatuck and
Nickerson State Parks and at the
Norwottuck Rail Trail. Other adaptive equipment is available for rowing and beach access.

An important part of all Outdoor Explorations programs is the service component, and each fair included a trail maintenance project. Volunteers came forth and helped DEM staff build a footbridge at Wompatuck and rebuild a 150-foot section of a boardwalk through a cedar swamp at Douglas State Forest. These cooperative events reinforced what Outdoor Explorations had already discovered—that there are many generous folks who are willing to volunteer their time to help build such projects.

FORGING PARTNER-SHIPS TO INCREASE ACCESSIBILITY

The Norwottuck Rail Trail is an 10-mile-long bikepath that winds its way through the pastoral landscape of the Connecticut River Valley, linking together the towns of Amherst and Northampton. Because the trail is paved for its entire length, it is very popular for all types of wheeled transportation vehicles: baby carriages, bicycles, rollerblades, and wheelchairs. For some people, however, enjoyment of the trail was hindered by the lack of suitable access and safe parking. In Amherst, wheeled access and adequate parking was available only at the southern end of the bikepath. This meant that wheelchair users and others on wheels had to go on and off the trail from the same entry point every time. The

Amherst Conservation Commission was the catalyst in what became a multi-lateral effort to provide barrier-free access at a midpoint along the trail's path through town. As a result of its efforts, the Mill Lane Rail Trail Access Way was born.

From the start, this project for improved parking and wheeled access served as a model of partnership and cooperation among a number of stakeholders. The Conservation Commission began by contacting the town's Disability Access Advisory Committee for recommendations on priority trail accessibility projects within the community. The site chosen for midpoint access to the Norwottuck Rail Trail was on land owned by Amherst College, a private liberal arts school located in the center of town. After a series of discussions with the College, a signed agreement was reached permitting access to the trail across its property. This arrangement represented the Colleae's first active involvement with the Norwottuck Rail Trail, which passes through 1.8 miles of its campus. DEM, with whom the town has participated in joint planning efforts on other Rail Trail access matters, awarded the Conservation Commission a Greenways and Trails Demonstra-

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tion Grant to cover the construction of the access way and parking area. The Town Trails Committee also got involved by volunteering labor for certain parts of the project.

The Mill Lane Access Way included grading and signing of the existing parking area to allow for approximately seven spaces, five standard and two handicapped. Fencing was installed along the edge of the parking area to prevent vehicular access to the new pathway and to guide users to the trailhead. Grading and traprock surfacing of the 240-foot pathway from the parking area to the Rail Trail was also completed. This included creating a special junction connecting a nearby town footpath with the new access way and thus the entire Norwottuck corridor. DEM also installed signs on the railtrail marking the entrance, further formalizing this new entrance way.

PROVIDING ACCESS TO THE WOODS

The Hamilton Conservation Commission can never be described as a Board satisfied to sit back and wait for work to come its way. It was the driving force behind creation of the 9.9-milelong Discover Hamilton trail, a town-wide greenway that winds through public and private lands in this semi-rural community north of Boston. Shortly after the trail was opened in 1995, however, Commission member John Hendrickson became aware that not all residents were able to enjoy Hamilton's natural assets because there were no wheelchair-accessible trails anywhere in town. Inspired in part by the experiences of a wheelchairusing neighbor and his family,

Hendrickson initiated a project called A Trail for All Americans. "This is a very active, outdoor-oriented family, and I would regularly see them go out on walks together up and down the street. It made me think, wouldn't it be great if they could, for example, drive over to the park and have access to the woods and other natural features of Hamilton? But the reality was that despite this wonderful new resource (the Discover Hamilton trail), such an outing was not possible because there were no provisions for barrier-free access to the new trail system."

The Conservation Commission decided to tackle this issue by first determining the best location for an accessible trail. The chosen route runs through Bradley Palmer State Park and along the scenic Ipswich River. This location was picked because it was felt to best represent the New England landscape, offering a spectrum of forests, wetlands, and a river, and the abundant wildlife found within each of these habitats. It also is situated so that the proposed half-mile trail can connect with an accessible wooden pedestrian bridge, providing fishing opportunities in the stocked river. In addition, the trail will link up with an existing park service road, accessible wading pool, and restrooms, totaling three continuous miles of access for wheelchair users.

Once the location had been determined, the Conservation Commission applied to DEM's Greenways and Trail Demonstration Grants program for support to draw up engineering plans. Additional funding to complete the project, estimated at \$15,000 was sought from other sources, and the trail itself is now

a testament to the project's success.

ADDITIONAL SOURCES OF INFORMATION

For additional information about universal access and design, consult one of the following publications:

- ◆ The 1991 Americans with Disabilities Act, which sets forth accessibility policy.
- The Uniform Federal Accessibility Standards (UFAS) published by the General Services Administration, Department of Defense, Department of Housing and Urban Development, and the U.S. Postal Service in April 1988, and the "Americans with Disabilities Act Accessibility Guidelines," published in the July 26, 1991 Federal Register (corrected January 14, 1992). Both of these publications give the minimum acceptable design standards for surface, structure, and facility development. The quidelines and law are available by calling 1-800-USA-ABLE. The quidelines are also available from the U.S. Architectural and Transportation Barriers Compliance Board, 1331 F Street NW, Suite 1000, Washington, D.C. 20004-1111.
- ◆ Recommendations for Accessibility Guidelines: Recreational Facilities in Outdoor Developed Areas, July 1994. Available from the U.S. Architectural and Transportation Barriers Compliance Board, 1331 F Street NW, Suite 1000, Washington, D.C., 20004-1111.
- ◆ U.S. Forest Service and U.S.
 Department of the Interior,
 National Park Service. Design

- Guide for Accessible Outdoor Recreation. Washington, D.C.: Government Printing Office, 1993.
- ◆ Universal Access to Outdoor Recreation: A Design Guide, a publication of PLAE, Inc. (Project Play and Learning in Adaptable Environments) and the U.S. Forest Service. Available from MIG Communications, 1802 Fifth Street, Berkeley, CA 94710; (510) 845-0953.
- ◆ Evan Terry Associates PC.

 Americans with Disabilities Act:
 Facilities Compliance Workbook.

 New York: John Wiley, 1992.

State and municipal offices, as well as private organizations that specialize in accessibility, are another avenue to explore. Potential sources include:

- your local center for independent living for information on universal design and for the names of people knowledgeable in outdoor accessibility.
- your town's task force on accessibility.
- ◆ the Massachusetts Office on Disabilities, One Ashburton Place, Boston, MA 02202; (617) 727-7440 or 1-800-322-2020.
- ◆ DEM's Access Coordinator, Tom McCarthy, Region 4/Connecticut Valley, Box 484, Amherst, MA 01001; (413) 545-5993.
- private groups which specialize in accessibility, such as Adaptive Environments (374 Congress Street, Suite 301, Boston, MA 02210; (617) 695-1225) and Outdoor Explorations (98 Winchester Street, Medord, MA 02155; 781-395-4999).

KEEPING YOUR INITIATIVE IN THE PUBLIC EYE

It is essential to continue to publicize and popularize your initiative throughout the planning and implementation process. There are numerous ways to do this, including producing written materials, airing public service announcements, and holding promotional greenway events. By highlighting the special characteristics of your project and the individuals involved, you can create unique promotional celebrations and guided walks or canoe trips with special guests and/or the local media—the possibilities are

almost endless. Regardless of the vehicles you choose, make sure you reach out to a broad audience. Work with a variety of groups such as conservation organizations, school children, senior citizens, scouts, and local government officials to publicize and popularize your greenway initiative. Targeting many different types of people will help you to build a broad-based constituency.

Active and on-going publicity of your initiative will increase its credibility and help to institutionalize the greenway plan. Try to persuade local officials and private and public organizations to endorse your project, or get your community to adopt your greenway strategy and map at town meeting. Ideally, you'll want the strategy to become part of the municipal master plan and your greenway to appear on the local land use map. Once part of municipal plan, the corridor will become a legitimate consideration in future land use decisions. "Official" acceptance of your greenway will also enable you to utilize local regulatory techniques to protect land within



The Shawsheen River Greenway Photo Contest was organized by the Andover Trails Committee to raise public awareness about the River and its greenway potential. The photos were exhibited in a local library for a month, along with maps to explain and promote the idea of a greenway.

the corridor. Depending on your community and on the nature of your proposed greenway, achieving this level of recognition could prove to be difficult. If you sense controversy, the potential negative impacts may outweigh the benefits. Again, you know your community best and will have to use your judgement in determining the appropriateness of "official" endorsement.

Regardless of whether or not your strategy and map become "official" elements in the local planning process, it is important to continue to work with municipal boards to identify existing programs and bylaws that can be used to advance your greenway goals and objectives. In addition, explore with local officials the possibility of incorporating specific greenway provisions into municipal regulations, where appropriate. Maintaining a good relationship with town officials, local conservation groups, and community groups will help keep your initiative alive.

FUNDING

The success of your greenway initiative will depend, in part, on successful fund-raising activities. Organizing the project, securing and developing the corridor, and maintaining a high public profile all require a certain level of financial wherewithal and technical assistance. There are several approaches to fundraising; the method(s) you choose will depend on the amount of money needed, the intended use of the funds, and the individuals and businesses involved. For example, full fee acquisition of a parcel almost always costs more than securing easements or cutting a trail. Your objectives for each section of the greenway will guide you in developing a project budget and in determining the most appropriate means of raising the funds necessary to carry out specific tasks. In addition, you will need to decide what combination of private and public monies will be used to fund your project. The answer to this question may well depend on the availability of local resources and public funds, and on how

well your project meets the criteria of a wide variety of public and private grant programs.

Below are a sample of methods commonly used to solicit funds and services necessary for establishing a greenway. In dealing with financial issues, it is important to think creatively and to utilize the widest range of options available. Potential sources of funding include:

- Local fund-raising activities
- A Private and nonprofit funding sources
- Municipal, state, and federal sources

LOCAL FUND-RAISING ACTIVITIES
There are countless ways to generate funds locally and many serve a double purpose in also publicizing and building credibility for your greenway. Organized events such as walk- or bike-a-thons, canoe or raft races, concerts, bake sales, and picnics appeal to a wide audience. On a larger scale, special events such as an auction or a benefit dinner

featuring a well-known guest speaker and local conservation or recreation leaders can raise substantial funds, although you need to be realistic about the time and effort it may take to organize such an undertaking. Greenway advocates in Stowe, Vermont raised money for the Stowe Recreation Path by "selling" pieces of the path. The names of the sponsors and sections of the path they purchased were published weekly in the local newspaper. Once your greenway has a name and logo, selling items such as T-shirts,



For the last twenty years, the Blackstone River Watershed Association Canoe Race has been an annual event in Northbridge. The fifteen-mile-long race is held in mid-May to promote awareness of the River and to raise funds for the Watershed Association's programs. Recreational use of the Blackstone has increased substantially over the last two decades as water quality has improved.

TIPS FOR WRITING GRANT APPLICATIONS

Get the guidelines. Always call the grantmaking agency or foundation for a copy of their guidelines. Guidelines usually include important information on deadlines, types of projects funded, and application format.

Use the grant name. Mention the broad topic of the grant program (e.g., "greenways") and be sure your proposed project is clearly intended to advance the purpose of that topic.

Be clear and direct. State the specific tasks to be accomplished near the beginning of the application. Using section titles such as "Goals" or "Tasks to be Accomplished" makes the application easy to read and clear to understand. If the agency guidelines do not provide an application form, create sections that match the criteria the agency seeks.

Include a summary. A short paragraph or box of text summarizing the proposal's goal, objectives, and expected product or service tells grant reviewers at a glance what the proposal is intended to accomplish.

Document the need. Try to make a clear case that the project is needed. Refer to supporting documents or prepared plans where appropriate.

Be realistic. Don't promise to do more than can be delivered or achieved within the grant's time frame or budget.

hats, pins, and bumper stickers provides another avenue for raising funds and further publicizing your efforts.

The business community is another good source for local funding. Local businesses and corporations are often willing to make donations of supplies or expertise for public service projects. These might include loaning equipment, providing supplies such as landscaping or construction materials, printing your brochure, adopting a segment of the trail to maintain and keep clean, or even offering the services of its employees. Other businesses may be willing to donate larger items such as furniture, a weekend

trip for two, or a month of free service that can then be raffled or auctioned off to raise funds. You might also approach local corporations for cash donations that can be used as matching funds for local, state, or federal grants. Another opportunity lies in developing a wish list of items you feel are most needed to help your greenway effort—tools, materials, office supplies, maps, etc.—and to publicize this around your community. When approaching local businesses for support, be ready to give a concise summary of your project that addresses what the benefits will be to the company or business as well as to the community. In addition to promotion-

al exposure and community goodwill, benefits to a business might include increased recreational opportunities for employees. In the case of larger companies, an existing greenway is often seen as improving the quality of life in the area and that may help attract high quality workers and executives.

PRIVATE AND NONPROFIT FUNDING SOURCES

Numerous private foundations and corporations provide financial assistance to community-based conservation initiatives. Since community service funds are often in high demand, you should be prepared to give a concise and compelling summary of your project that includes what the benefits will be to the community. You should also consider each company's fiscal timetable. Many businesses determine their budgets for the next fiscal year in the fall, so you will want to contact them with your request well before that time. In researching foundation and corporate grants, draw on your knowledge of the business community and upon your network of supporters and their personal and business contacts. You may also want to consult your local library for listings of these entities and their grantmaking policies and requirements. The Associated Grantmakers Library is an excellent source of information on grant programs and their sponsors (see Appendix B).

Another source of greenway funding and technical assistance is through nonprofit organizations such as land trusts or conservation organizations. Many times these groups are willing to "take on" a particular project and to help secure charitable contributions from its members to support it. In other cases, their assistance may come from negotiating donations of easements or access agreements, providing legal assistance, or helping to prepare maps or brochures. Further information on these types of assistance may be available from other greenway groups, the Massachu-

setts Greenways Council, government resource agencies, the Associated Grantmakers Library mentioned above, and the hundreds of local land trusts that currently exist across the state. Some of these organizations provide financial and technical assistance in addition to general advice on fund-raising. See Appendix B for sources of technical and planning assistance and Appendix F for a list of land trusts in Massachusetts.

MUNICIPAL, STATE AND FEDERAL SOURCES

A number of public agencies provide grants for planning, improving, and acquiring open space. At the municipal level it may be possible to secure funding through one or more departments that is involved in related work, such as parks and recreation or open space protection. If possible, try to find a town board or municipal agency to sponsor your project, and work through them to sell the idea to public officials, municipal staff, and other stakeholders. This sort of sponsorship may also prove critical for funding and maintenance needs in the years ahead.

Securing state and federal grant monies has become increasingly difficult over the past ten years. It is not impossible, however, given some ingenuity and hard work. An excellent place to start is by contacting state agencies that handle the sorts of issues addressed by your project, such as outdoor recreation, environmental and open space protection, transportation, fish and wildlife protection, and coastal zone management. Explain your proposed project and the type of help you need, and find out what sort of funding or technical assistance programs they have to offer. See Appendix I for a list of

grant programs for planning, protecting, or improving open space.

The Department of Environmental Management sponsors the Greenways and Trails Demonstration Grants program specifically aimed at supporting innovative, communitybased greenways and trails efforts in Massachusetts. Small grants are available annually for greenway planning, mapping and resource assessment; public education and community outreach; and greenways and trails management, maintenance, and expansion. Since its inception in 1993, this program has provided financial and technical assistance to more than two hundred projects throughout the Commonwealth. DEM also sponsors the Coastal Access Small Grants program which supports projects enhancing public access to the coast, particularly through coastal trails. See Appendix G for a sampling of greenway, trail, and coastal access projects funded through these programs.

Federal funds are often disbursed through state programs, so you may have covered many of these when exploring state funding programs. Nonetheless, it is wise to explore all possible avenues through the regional offices of federal agencies, through your regional planning commission, or through your local congressional representatives. For example, the Merrimack River Trail, which winds its way from Tyngsboro on the New Hampshire line to the coastal community of Newburyport, owes its support and progress to the collective actions of its state senator, the National Park Service, and a local river group. One more recent source of federal monies for greenways is the Transportation Equity Act for the twenty-first century (TEA-21) which includes grants for transportationrelated trails and bikepaths, scenic highways, walkways, as well as for local and state transportation planning. This program is administered by the Massachusetts Highway Department; however, local applications are

submitted through the thirteen Regional Planning Agencies (see Appendix B).

Raising money and applying for grants is hard work. There are, however, several ways to help stretch the precious dollars you do obtain. These include:

- establishing partnerships with other conservation groups
- soliciting donations or partial donations of land
- taking advantage of in-kind contributions
- utilizing the skills and talents within your community



Jogger enjoys a fall afternoon run on a woodland trail in Hudson, along the route of the Assabet River Rail Trail.

Just as linking natural resources together increases their value, pooling financial resources can also have a synergistic effect. For example, a local land trust or conservation group may not be able to donate money to your general fund, but they may be interested in working together to secure a particular section of the greenway. In addition to the obvious benefits of sharing costs, cooperative management and the added expertise a land trust can bring to the project will greatly enhance the value of each dollar spent.

It is also important to remember that a great deal can be accomplished through inkind contributions, volunteer efforts, and donations of land and interests in land. Tax benefits often available when land is donated or sold to a conservation organization for less than its full market value can provide landowners with a real financial incentive for

making a donation. Encouraging landowners to take advantage of these benefits enables them to be generous without bearing as great a financial burden. In this way, more land is protected per dollar spent.

Finally, never underestimate the power of grassroots enthusiasm. When people truly believe in a project, they will go to great lengths to help ensure its success. The key to tapping into local support is to get community members excited about the greenway early on so they willingly donate their time, expertise, and resources, and help convince their friends to do the same. While state and federal assistance can be a catalyst for action, it cannot be the foundation. Commitment, energy, and enthusiasm from within your community is what will keep the project alive when outside attention and financial support have shifted to other initiatives.

Chapter Six

KEEPING YOUR GREENWAY ALIVE



nce the implementation phase of your initiative is underway, it is essential to maintain a positive image. Continued popularity and pride in the greenway will generate the support necessary to keep it growing. Greenway users who value this resource will be more likely to join in efforts to extend the trail or to upgrade and maintain existing sections. Active management and maintenance programs are an integral part of providing quality recreational opportunities and preventing potential negative impacts on landowners. Effective management will also help ensure that your conservation and recreation objectives are met and that your greenway continues to be a safe and desirable community resource.

MANAGING AND MAINTAINING YOUR GREENWAY

Greenways protect the resources they link together and often enhance their value. By connecting these areas, however, you are creating a new and more complex resource to be managed and maintained. To address these

needs, it is wise to develop a management strategy as soon as you begin to secure your greenway. In general terms, this strategy should describe how the greenway will be managed, used, and maintained. It should also identify how specific tasks will be carried out and who will be responsible for them. Having this type of framework in place as sections of the greenway are completed will help ensure proper use and stewardship of the resources you intend to protect.

If many parties are involved—as is usually the case with greenways—it is helpful to draft a cooperative management agreement. In this type of arrangement, the management issues and needs are identified, and the rights and responsibilities of the various entities are clarified. For example, if you've secured trail easements over private property to link a conservation area owned by a nonprofit with a town park, your management agreement might state that the town will cut the path and provide the necessary materials, and that the nonprofit will mark, maintain, and monitor the trail according to certain specifications. Schedules and assignments for various maintenance activities such as litter collection or posting signs should also be included. If each party

knows and is comfortable with their responsibilities from the start, the tasks will more likely be accomplished in an orderly fashion, resulting in a well-maintained greenway.

Even if your greenway group is the primary steward, it is a good idea to formulate a strategy for managing and maintaining the corridor. The following section contains some basic ideas to use in developing the framework for such a strategy. It includes potential issues and tasks to

consider, as well as suggestions on how to proceed. Remember that the ideas presented here are general and will need to be developed and tailored to your particular project.

One of the first steps in developing a management plan is to determine the specific issues you need to address. These might include potential conflicts between habitat protection

PROTECTING ESTABLISHED GREENWAYS: TRAIL STEWARDSHIP AND PATROL

Nost of us would agree that I the growing popularity of trails represents real progress and a job well done. However, increased public awareness and use often creates new challenges for land managers, usually in the form of greater resource impacts and increased potential for visitor conflicts. Two projects from opposite ends of the state demonstrate an innovative way of tackling these management challenges, and illustrate how this approach can be adapted to the variety of issues and conditions found on Massachusetts trails.

TACONIC CREST TRAIL RIDGERUNNER

Offering panoramic views of three states, the Taconic Crest Trail runs thirty-five miles from southern Vermont to Pittsfield, Massachusetts, following the ridgeline that defines the Massachusetts-New York border. This popular hiking and biking trail was originally built in 1948 by the Taconic Hiking Club (THC). The

THC has more recently joined with Williamstown Rural Lands Foundation (WRLF) to provide ongoing stewardship, and with the Massachusetts Department of Environmental Management (DEM), the New York Department of Environmental Conservation, the National Park

Service, and the Appalachian Mountain Club to create a permanently protected greenway along the trail.

While periodic workdays and treks have done much for maintenance and monitoring, THC and



Leonard "Flip" Fortin was a summer ridge runner for the Taconic Crest Trail. In addition to leading volunteer workdays, he was responsible for monitoring and maintaining degraded sections of the trail.

WRLF felt it was important to establish a consistent presence on the trail. With the help of a DEM Greenways and Trails Demonstration Grant, WRLF established a monitoring program and hired

Leslie F

and recreational use, erosion along stream banks or steep trails, potential conflicts among different recreational uses, or the impacts of recreation on existing activities such as farming, residential use, or wildlife habitat.

ESTABLISH USER GUIDELINES TO ADDRESS MANAGEMENT ISSUES A well thought-out set of user guidelines will help to ensure user safety, minimize conflicts

among users, and prevent environmental degradation. These will likely focus on when, where, and to what extent particular uses are permitted. It is helpful to post signs and to distribute leaflets which explain these ground rules.

ESTABLISH A MONITORING PROGRAM It is essential to develop a means of monitoring the greenway to make sure users are acting in accordance with the guidelines. This

ridgerunner Leonard "Flip" Fortin. In addition to completing several trail rehabilitation projects on badly eroded sections, Flip conducted regular patrols of the entire length of the trail to identify blowdowns and other maintenance needs, and to monitor the effects of ongoing trail use.

The overall goal of the Patrol is NOT enforcement, but rather educating trail users before they break any rules

In addition to these steward-ship duties, Flip, identified by his special ridge-runner T-shirt, educated hikers about what he was doing and why, and provided information about the trail and user guidelines. Hikers appreciated the opportunity to ask questions and, more importantly, to get answers. Meeting someone working on the trail in an "official" capacity helps users realize what it takes to

maintain a trail, and gets them thinking about what they can do to enhance these efforts.

NEW ENGLAND MOUNTAIN BIKE PATROL

Some 150 miles east of the Taconic Crest, but a mere 5 miles from downtown Boston, lies the Middlesex Fells Reservation, managed by the Metropolitan District Commission (MDC). Several million people live within easy striking distance of the Fells, and a good portion of them like to hike, bike, walk, or run in the nearby woods. This, coupled with a "no bicycles on single-track trails" policy, makes the Middlesex Fells a prime location for real and potential trail user conflicts. As a result, the New England Mountain Bike Association (NEMBA) and the MDC selected the Fells to host the first New England Mountain Bike Patrol unit.

The overall goal of the Patrol is NOT enforcement. Instead the focus is on educating trail users before they break any rules and serving as a liaison between mountain bikers and other user groups. Patrollers ride throughout the Fells during peak use periods, monitor the physical condition of the trails and the Reservation as a whole, and report any problems to the MDC. Thanks in part to grants,

donations, and in-kind help from a growing list of friends and sponsors, patrollers wear readily recognizable jerseys, and carry maps, brochures, tools, first aid kits, and even a cellular phone for emergencies. At the start of the program, a patrol training clinic familiarized patrollers with the park and the types of questions and situations they might encounter.

It is hoped that these two efforts can serve as models for similar initiatives in other heavily-used areas. If you are considering starting your own patrol and stewardship group, or if you would like to learn more about either of the programs described above, please feel free to contact them. For information on the Taconic Crest Trail, contact WRLF at (413) 458-2494; for the Middlesex Fells/New England Mountain Bike Patrol, call the patrol hotline at (617) 621-9545, ext. 150.

(This article was written by Leslie Reed-Evans (WRLF) and Krisztina Holly (NEMBA), with assistance from Jennifer Howard and Peter Brandenburg of DEM. It first appeared in the Late Winter, 1996 issue of Viewpoints: The Massachusetts Greenway and Trails Forum.)

may be done by volunteers, local police, park staff, or neighborhood groups. In addition, an enforcement mechanism should be in place so monitors know what to do or who to call in the event of a problem.

IDENTIFY MAINTENANCE NEEDS

Determine in advance the type and extent of maintenance activities your greenway will require, and how many people will be needed. These can range from annual tasks such as stream bank stabilization and general trail maintenance, to regular mowing, plowing, planting, and litter collection.

DEVELOP A MAINTENANCE WORK PLAN

This plan should explain the tasks to be completed, and include a work schedule with specific assignments.

ESTABLISH A CORPS OF VOLUNTEERS

An organized corps of volunteers can effectively and economically ensure that the greenway is well maintained over time. In addition, volunteer efforts can serve to publicize your initiative and generate support. Local schools, nature centers, scout groups, conservation organizations, and community groups are all potential sources to tap for volunteers. Organizing a special subcommittee to recruit and supervise volunteers will enable you to develop a good group and to ensure that the work is accomplished as efficiently and effectively as possible.

KEEP YOUR GREENWAY GROUP ALIVE

Keeping your greenway group together is critical to the continued success of the project. Regular meetings help to maintain the group's cohesiveness and provide opportunities to monitor progress, plan events, evaluate the

maintenance program, and continue fundraising efforts.

HOLD GREENWAY MAINTENANCE EVENTS

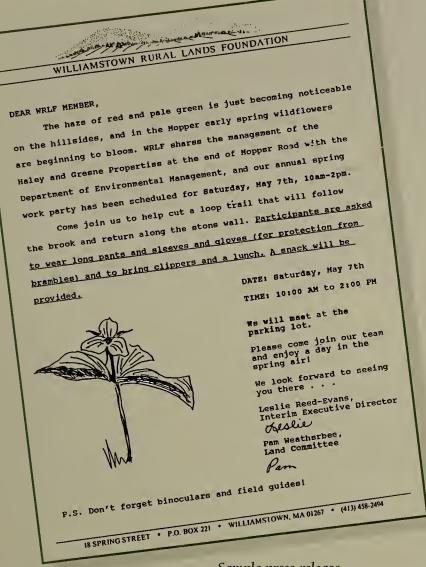
Greenway maintenance events can serve a variety of purposes. They benefit the greenway directly, and enable those involved to experience firsthand what the project is all about. For example, a litter walk followed by a barbecue results not only in a cleaner greenway, but serves to bring together a variety of individuals as co-workers and can generate a good deal of positive press as well.

CONTINUE TO PUBLICIZE YOUR INITIATIVE

A well-maintained and utilized greenway promotes itself. However, you must continue to actively publicize your initiative to ensure that nonusers are made aware of this new community resource, experience its benefits, and understand the need for continued support from the community at large.

COUNTERING CONCERNS ABOUT GREENWAYS

Managing and maintaining your greenway will go a long way toward fostering and perpetuating a positive public opinion of your initiative. However, you should also be prepared to constructively deal with opposition to your greenway project. Very often, opposition stems from fears that the greenway will in some way harm individual property owners or the community as a whole. One of the best methods of countering negative comments is to provide information that proves otherwise.



Sample press release announcing a volunteer workday for trail maintenance.

ADDRESSING THE CONCERNS OF LANDOWNERS

Most concerns voiced by the owners or abutters of potential greenway parcels have to do with vandalism and crime, liability, maintenance, litter, and property values. These are all legitimate concerns and you should be prepared to discuss these issues with landowners and with community members at large. Some issues can be worked out through realigning trail routes, by providing adequate buffers, or by explaining how the greenway will be patrolled and maintained, and who will be responsible for these activities. It is important to recognize that some individuals will be opposed to the greenway

and will never permit public access across their property. However, many landowners will consider granting access if they can be assured that the greenway will not intrude into their private lives, damage their property, or result in financial loss.

A significant amount of research has been done to determine if formally designated trails do, in fact, result in harm to property owners. A number of studies conclude that wellestablished greenways cause very few problems. As summarized by greenway proponents in New Jersey: "They attract joggers, families, and serious walkers and because of this traffic are not favored for teenage hangouts or as an escape route for thieves." 10 Follow-up studies on the Minuteman Bikeway, which in Lexington runs along an abandoned rail line, found that the number of burglaries to adjacent homes decreased because police could enforce a curfew along the trail route, effectively

eliminating late night parties.¹¹ Similar results were found along the Burke Gilman Trail in metropolitan Seattle, a twelve-milelong bikepath linking six public parks and passing through an industrial area, several commercial areas, residential neighborhoods, and the University of Seattle. A 1986 evaluation of the trail's impact on property values and crime showed no increase in burglaries or vandalism to homes as a result of being adjacent to the trail.¹² This is not to say that no damage will occur with the opening of a trail corridor. Nuisance littering, wildflower picking, graffiti painting, and minor vandalism of signs and benches have all been noted. Homeowners should be assured, however, that if a problem occurs, the local police will respond.

Maintenance concerns can often be addressed through volunteers. Local boy and girl scout troops, hiking clubs, garden clubs, land trusts, and conservation organizations are all excellent sources of help in maintaining greenways and trails. Maintenance activi-



Adopt-a-Trail groups play a major role in maintaining the Cape Cod Rail Trail in Eastham. Under the supervision of Nickerson State Park Superintendent Steven Nicolle, four or five groups of volunteers help with trail work from spring to fall.

ties usually consist of hiking the trail once or twice a year and cutting brush, removing trash or litter on a regular basis, fixing damaged trails, clearing downed trees, replacing or repairing trail markers, removing noxious vegetation, and the like. You also might explore having local companies, schools, or community groups "adopt" a section of the greenway in which case they are responsible for keeping their stretch clean and well-maintained. For heavily-traveled urban trails or bike paths that are paved or graveled, it may be necessary for safety reasons to bring in a paid crew to maintain the trail surface and for regular mowing and brush cutting. This might be a situation where your local Highway or Public Works Department could donate the use of its crew and equipment as a way to show municipal support for the project.

Finally, landowners are often hesitant to permit public use of their property for fear they will be liable for injuries sustained on their land. While greenway users can sue landowners, liability is limited by Massachusetts state law. In general, if a landowner permits public

use of his or her land for recreational purposes and does not charge a fee for such use, then he or she is not financially responsible for injuries sustained by a user. This assumes that the landowner has not willfully created a hazardous situation and has made an effort to repair or warn users of hazards that are known to exist. (See Appendix J for more information on landowner liability and the law.)

ADDRESSING THE CONCERNS OF LOCAL GOVERNMENT

If local governments oppose greenways and open space protection initiatives, they usually do so on economic grounds. They are often concerned that these efforts will cost their municipalities money and that the costs will outweigh the benefits. While greenways do cost money to secure and maintain, there is evidence that they can provide significant economic benefits.



Local businesses have agreed to take on clean-up and maintenance responsibilities along certain sections of the Norwottuck Rail Trail.

n clean-up

VOLUNTEERS FOR THE HOUSATONIC RIVER

The next time you find yourself traveling through southern Berkshire County, pull off Main Street in Great Barrington. In back of River House and Brooks Drugs lies a tranquil walk along the shores of the Housatonic River. "Transformed" is the word that comes most often to mind when comparing how the same area looked just ten years ago. And this refers to much more than just the clean riverbanks and new pathway. Behind the Housatonic River Walk is an inspiring story of volunteerism and community spirit that continues to build upon itself. "People are always saying thank you to me (for the River Walk), but it is the community that is doing this," says River Walk coordinator Rachel Fletcher.

The River Walk is now in its tenth year of operation, but the stage was set long ago when the river was an open dumping ground for industrial and household wastes. Like many New England towns, Great Barrington was built with its back to the river. "We're going to put our fronts to the river with the greenway," Fletcher now says, although it may not have seemed that way back in 1988 when, one day, she looked out the window of the Southern Berkshire Community Land Trust office and saw its backyard filled with litter. "I saw all this junk on the riverbank and thought, how can we be a land trust if we can't take care of our own backyard?" She wondered, how bad can a clean-up project be? So, she and a dozen others cleaned the river-



Students from the Rudolf Steiner School haul chips to surface the Housatonic River Walk during one of the many community work days that went into creating a walking path along the Housatonic River in downtown Great Barrington.

bank behind the Land Trust office. The following year she worked with sixty eighth graders from the Seales Middle School to clean up 266 feet of riverbank behind their school. This was followed by a third clean-up in 1991 behind Brooks Drugs, and a wildly popular river parade that same summer. The Land Trust and the owner of Brooks Drugs then granted the Great Barrington Land Conservancy a permanent easement to the river on behalf of the River Walk, and the initial 136 feet of the River Walk opened on November 1992. Another 277 feet was completed by volunteers in 1994, followed by an additional 150 feet in 1996. What started out as a one-time effort to clean debris

from along the river has grown into a permanent project.

While Fletcher coordinates the clean-up work and Peter Jensen of Open Space Management designed the trail, she is quick to acknowledge where the credit really lies. "Instead of hiring a professional crew, we use as many volunteers as are willing. Ordinary people do extraordinary things to make the River Walk happen. We work whenever we can, and through these days we become a presence that endures—day after day, week after week, year after year. In the process, we're learning something about who we are as a community, who our neighbors are, and whom we can count on. When the community is involved this

way, people become stewards and take social responsibility. With each act of caretaking there forms an attachment that leads to a sense of place." Volunteers have been so vital to this project that Fletcher doesn't usually measure the trail in feet. Instead, she says that River Walk is more than 950 volunteers long. As of May 1996, these people have donated more than 8,750 hours of their time (not including planning and designing), removed some 200 tons of rubble and debris from the banks of the Housatonic River, and then hauled in nearly an equal amount of rock and other materials to make a trail. But Fletcher notes that the role of volunteers extends beyond merely moving rocks and disposing of litter. "We try to make our decisions by consensus. That can be tricky because the issues are difficult. Do you use chemicals to control vegetation? Do you use power equipment or cut by hand? Everyone has a different opinion about it. Yet, somehow with this group of people there have been some wonderful meetings where everyone says what they think, everyone listens, and then a decision is made that really isn't any individual's decision but a decision by consensus. This happens right at the worksite, and that's why it works. The problem is looking you right in the face and you can't pretend its something else. We've made some really good decisions because of that." "Our pragmatic goal, reflects Fletcher, is to clean up, restore, and install a trail between two bridges in downtown Great Barrington. The underlying agenda is to bring people back to the river, because the Housatonic forms the spine of the region and ties all the towns together."

Fletcher points out that having a strong volunteer component requires substantial commitments of time, both organizationally and in the field, but she says

this approach more than call to itself in long-term river and greenway maintenance and protection. It also earns the trust and support of property owners and the general community. "t would have been much easier for an organizer to raise the funds, bring in a professional crew and it would be done already. But by having hundreds of people doing it, especially schoolchildren, and everybody working side by side, there's a sense in which we are accountable, we're responsible (for the river). There's a real joy that people get just from being down there." And the regular group of volunteers seem to agree. "It's the diverse involvement of the community that gives it appeal," echoed Peter Jensen, "the broad support by the citizenry that's reflected in the number of volunteers and in their diverse backgrounds." For Glen Chamberlain, it was also this theme of community. "I started out just wanting a clean riverbank. Little did I know the labor of love the River Walk project would turn into, and how it would add to my sense of home." And it is not just townspeople who volunteer and who have developed a sense of ownership with their work. Bernard Kirchner comes from neighboring Sheffield because River Walk "addresses my role as a parent with a child who also works on the River Walk—the community aspect, the ecological aspect—they're all here on the riverbank."

For more information contact Rachel Fletcher, Great Barrington Land Conservancy, 145 Main St., Great Barrington, MA 02130; (413) 528-3391.



Housatonic River Walk, Great Barrington.



It took seventeen years to plan and build the Minuteman Commuter Bikeway outside of Boston, but the wait was worth it for nearby businesses such as The Bike Shop, which is now a stopping point for many bikeway users.

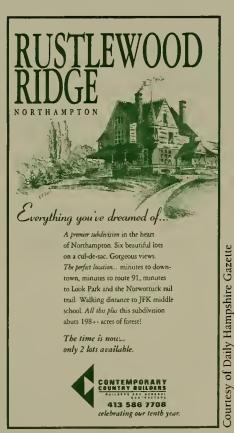
Many communities have discovered that greenway initiatives can do more for a town than protect the resource base and provide recreational and transportation opportunities. Recent studies have shown that trails and greenways can also bring money into the communities through which they pass, by a combination of newly-created jobs and the expansion of existing businesses. A few years ago, DEM undertook a survey of thirty-eight businesses located mostly within a one-half mile radius of the Cape Cod Rail Trail to examine how rail-trail users affect neighboring businesses. Twenty-four percent of the business owners stated that the rail-trail played a part in the opening or acquisition of the businesses. Sixty percent said they had expanded their operations since opening, and of these about half listed the rail-trail as a prominent factor in their expansion decisions. In terms of sales, 53 percent reported revenues from trail users constituted over 10 percent of their annual total revenues, and 75 percent indicated that the proximity of the

rail trail to their business would make it easier to sell it in the future. Similarly, along the Minuteman Commuter Bikeway west of Boston, Steve's Ice Cream Shop in Arlington serves about 200 more people a week since the bikepath opened, and the Gap clothing store in Lexington claims a 30 percent increase in business because of the trail.

Area real estate agents may also be able to help substantiate your economic justifications for open space protection. A number of studies have clearly shown that trails, especially in urban and suburban areas, are considered by realtors as a valuable amenity to attract homeowners to a community. In a recent study conducted around metropolitan Denver on the effect of urban trails on nearby property values, 73 percent of the realtors

interviewed thought that a home adjacent to a

trail would be easier to sell and 58 percent believed that such a home would sell for more than one in a neighborhood with no trails. Similarly, 57 percent of the owners of single family homes felt that having a trail nearby would make it easier to sell their homes, while 29 percent believed they would be able to get a higher price. Residents of apartments, townhouses, and condominiums adjacent



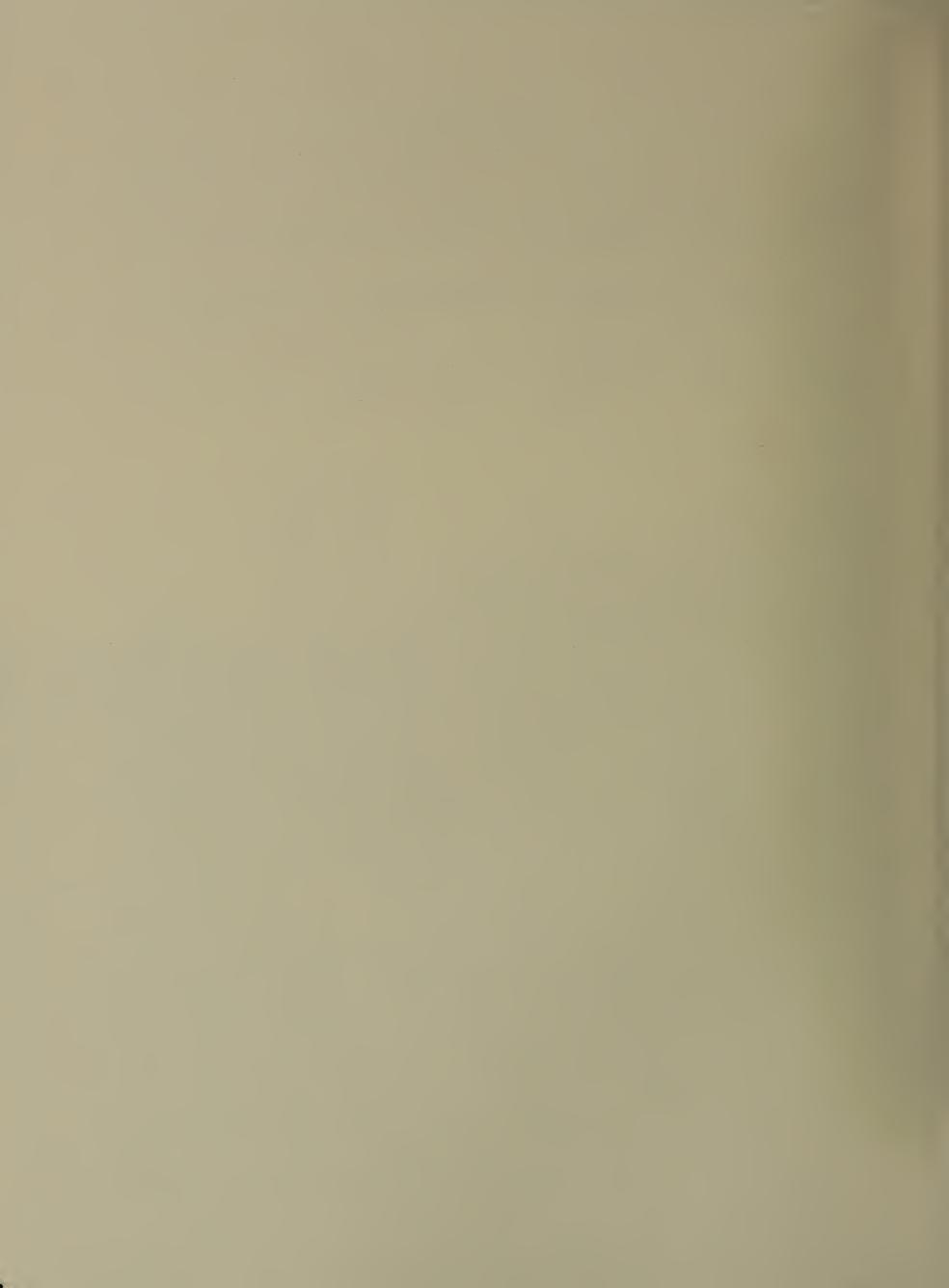
The amenity value of the Norwottuck Rail Trail is reflected in this real estate ad which markets proximity to the Rail Trail as a locational asset.

to the trail were unanimous in their opinion that it would not decrease the selling price of their properties. ¹⁵ In making your case to local officials and community members, you might also call upon the benefits of greenways which are more difficult to quantify such as increased tourism, enhanced potential for corporate relocation, retention, and employee recruiting, and lower costs for pollution treatment because of resource protection.

Providing landowners and community members with objective information on the impacts and benefits of greenways will help convince them that greenways do not pose a threat to their safety, compromise property values, or expose them to unreasonable lawsuits. In addition, speaking with police and others involved in managing a nearby greenway or trail is often helpful in allaying fears about crime and vandalism. Finally, putting landowners in touch with people who actually live near greenways or who have granted public access easements across their property without detriment can go a long way in addressing their concerns and gaining their support.

Conclusion

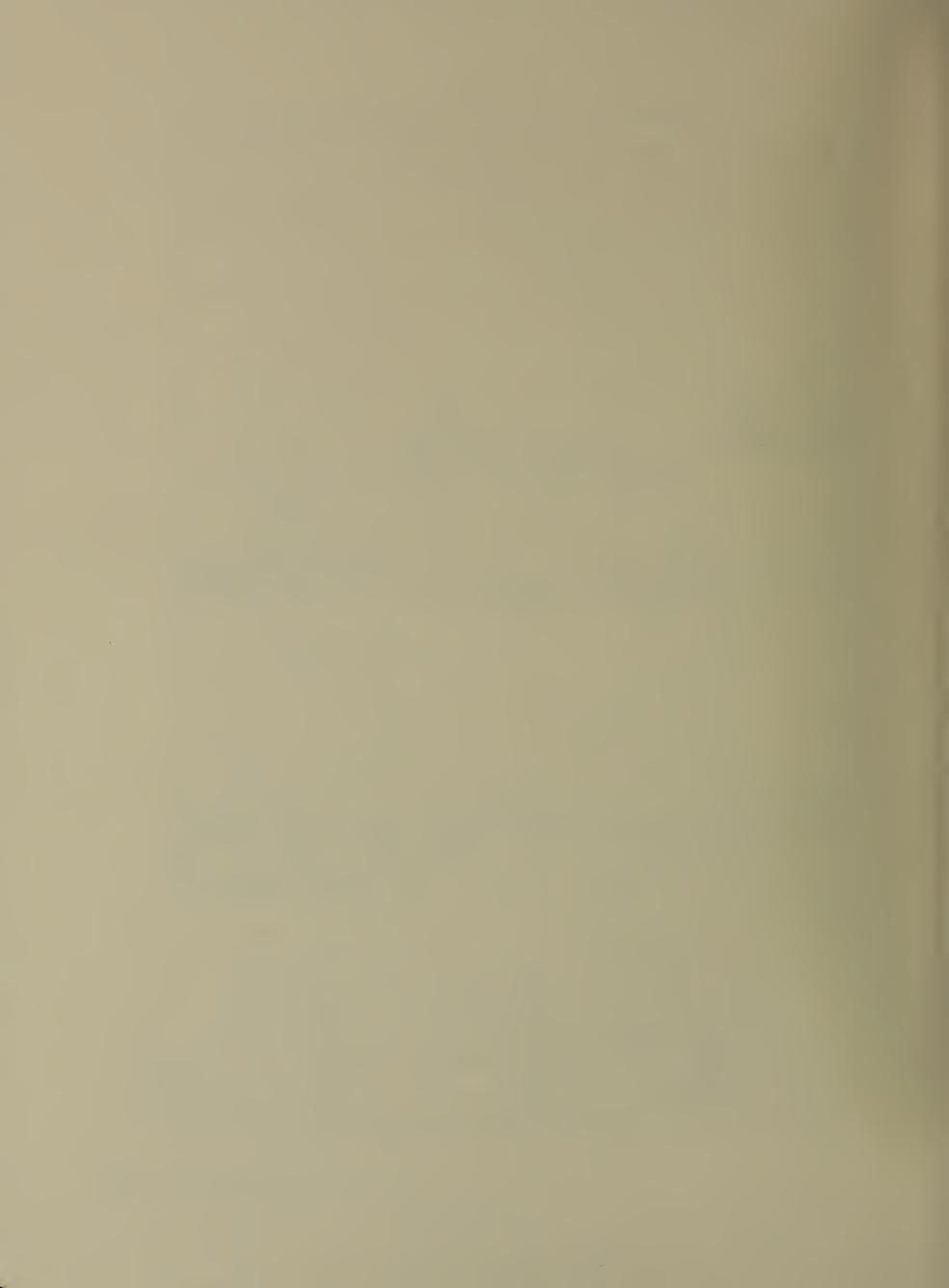
The Modern Greenway— An Jdea Whose Time Has Come



In Frederick Law Olmsted's time, the greenway concept was a visionary idea. Today, greenways offer a practical solution to current demands for open space and resource protection. They provide a feasible means for communities to satisfy both social and environmental needs during a time when land prices are high, resources are increasingly threatened, and state and federal aid is scarce. Greenways are also appealing because they protect and provide access to the outdoors while respecting local control and private property rights. They are created by and tailored to the communities through which they pass, and as a result, greenways are generally quite popular among residents. Unlike many of the more regulatory resource protection techniques, creating a greenway is often perceived as giving something back to a community rather than taking something away. The goals and characteristics of greenways themselves reflect many important values and themes in our society, including health and fitness, family recreation, habitat and wildlife protection, water resource protection, mobility with less dependence on the automobile, and overall environmental awareness.

Greenways focus on experiencing the landscape by moving through it. Whether riding twenty miles on a bicycle, taking a stroll along a path, or sitting by a stream and imagining where it leads, the emphasis of most greenways is on motion and the endless possibilities that exist around the next bend. Although the majority of greenway users stay fairly close to home, the concept of having access to a network that meanders across and about the country is an image which few can resist. Greenways combine a spirit of adventure with the needs and realities of modern society. The greenway approach to open space and recreation planning is an idea whose time has come.

In the words of the Report of the President's Commission on Americans Outdoors, "Greenways have the potential to become this country's most important land-based effort for conservation (and) recreation in the next several decades." The vision of establishing greenways across America is an inspiring and intriguing idea. While it may seem like an overwhelming task, the path to achieving this great vision begins here in Massachusetts, in your community, and most of all, with you.



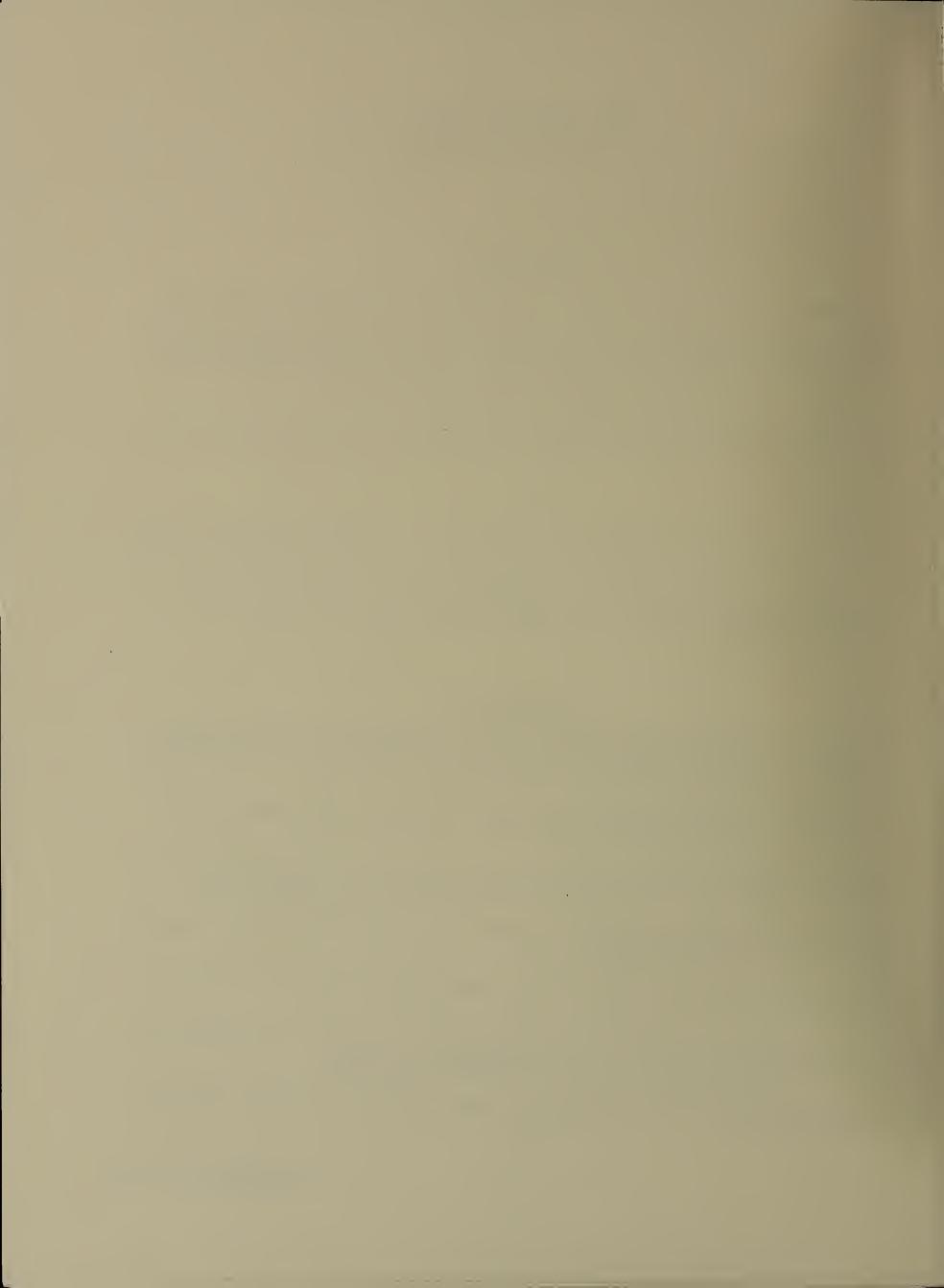
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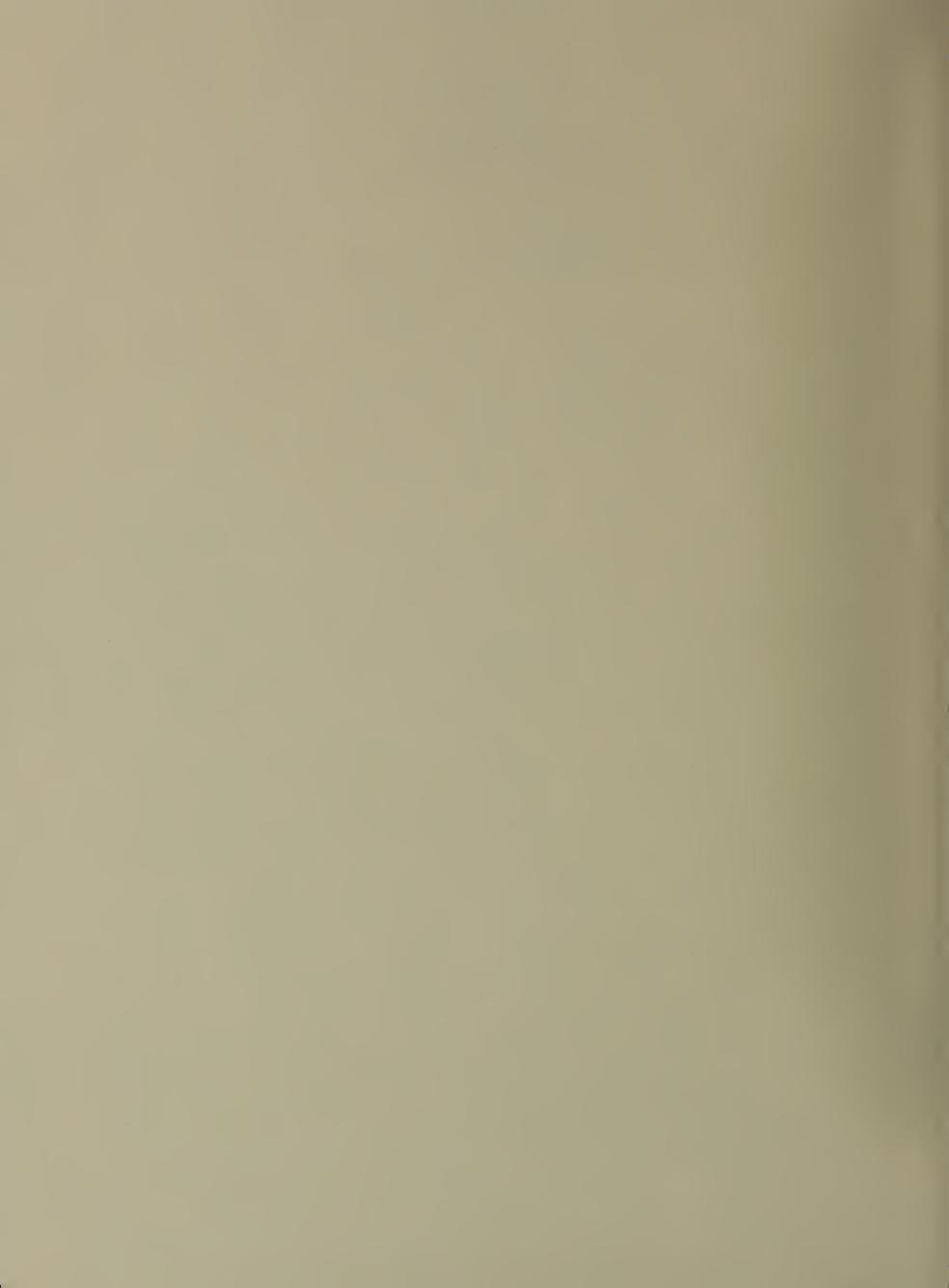
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Section Three

Appendices



APPENDIX A

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These plans are available for review at DEM, 136 Damon Road, Northampton, MA 01060; 413-586-8706

APPENDIX B

Sources of Technical Information

This annotated directory describes the type(s) of technical and planning assistance available from major state, federal, and nonprofit sources. It also includes Regional Planning Agencies (RPAs), trail organizations, Watershed Associations and related organizations, and a list of acronyms for governmental offices and programs. Other sources of assistance include local land trusts (see Appendix F) and town boards such as the conservation commission and planning board.

STATE GOVERNMENT OFFICES

Cooperative Extension Service, Stockbridge Hall, University of Massachusetts, Amherst, MA 01003; (413) 545-4800. Cooperative Extension serves as the outreach arm of UMass and the U.S. Department of Agriculture. It provides educational and technical assistance in programs such as agriculture, natural resources management, and community planning and development.

Executive Office of Administration and Finance, Division of Capital Asset Management (DCAM), Office of Real Estate, One Ashburton Place, Boston, MA 02108; (617) 727-8090. The Office of Real Estate provides information about state-owned lands within municipalities.

Executive Office of Communities and Development (EOCD), Division of Community Services, Bureau of Planning and Regionalism, 100 Cambridge Street, Boston, MA 02202; (617) 727-7001. A wide variety of land-use and planning assistance is offered to municipalities by EOCD including Land Use Manager, a monthly newsletter with information on changes or interpretations of zoning laws; general zoning and land-use information by phone from EOCD staff; site visits and consultations with EOCD staff; and training and seminar sessions for volunteers and paid staff of local town boards. The Bureau of Planning and Regionalism also offers local government assistance through its Strategic Planning Grants program; see Appendix I.

Executive Office of Environmental Affairs (EOEA)

EOEA: Massachusetts Office of Coastal Zone Management Program (MCZM), 100 Cambridge Street, Boston, MA 02202; (617) 727-9530. MCZM provides planning and technical assistance concerning the protection, development, and revitalization of resources in

the coastal zone. It also coordinates nonpoint source pollution control assistance statewide.

Harbor Planning Program (617) 727-9530, ext. 456. MCZM's revised Harbor Planning Program now includes two components: harbor management activities and comprehensive harbor planning. Under the former, MCZM provides technical assistance to solve immediate problems in a streamlined way that involves no regulatory framework. It also works in partnership with communities to develop long-term comprehensive harbor plans that achieve both local and state objectives. MCZM offers Harbor Planning Grants to prepare comprehensive plans (see Appendix I).

Massachusetts Bays Program, (617) 727-9530, ext. 406. The objective of the Massachusetts Bays Program is to increase awareness of water quality issues and to promote innovative, coordinated approaches to water quality management. The program also provides two types of grants, Bay Action Grants and Demonstration Grants (see Appendix I).

EOEA: Department of Environmental Management (DEM), 100 Cambridge Street, Boston, MA 02202; (617)7273160(general switchboard); www.state.ma. us/dem

A.C.E.C. (Areas of Critical Environmental Concern), (617) 727-3160, ext. 552 or (413) 586-8706. ext. 21. An ACEC contains a concentration of highly significant environmental resources formally designated following a public nomination and review process. The ACEC program does not acquire land but assists in the protection and preservation of these critical areas through better environmental planning, review, and cooperation at the local, regional, and state levels.

Bikeway and Rail-Trail Program, (617) 727-3160, ext. 557. This program is involved in rail-trail and bikeway development, providing planning, design, and technical assistance. It also serves as staff to the Massachusetts Bicycle Board.

Coastal Access Program, (617) 727-3160, ext. 528. This program focuses on enhancing, improving, managing, and expanding public access to the Massachusetts coastline. The program provides financial assistance through the annual Coastal Access Small Grants Program (see Appendix I), technical assistance through the Coastal Access Conflict Resolution Service, support for local "Sea Path" intertidal pathways, and coastal land acquisition planning for DEM.

Connecticut Valley Action Program (CVAP), (413) 586-8706, ext. 19. CVAP works with local officials and citizens in the planning, acquisition, and protection of the Connecticut River corridor, including the new Connecticut River Greenway State Park. It provides assistance in land negotiation, wetland and watershed protection, open space planning, and river recreation.

Division of Forests and Parks, (413) 727-3180. The Division of Forests and Parks maintains the State Forest and Park system for conservation, recreation, and forestry purposes, promotes the Commonwealth's public and private forestry resources, and provides and manages urban and regional recreational facilities. Activities are organized geographically by regional office.

Region 1 (Southeastern Massachusetts): Myles Standish State Forest, Box 66, South Carver, MA 02366; (508) 866-2580

Region 2 (Northeastern Massachusetts): 817 Lowell Road, Carlisle, MA 01741; (978) 369-3351

Region 3 (Central Massachusetts): Route 110, Box 155, Clinton, MA 01501; (978) 368-0126

Region 4 (Pioneer Valley/Connecticut River Valley): Box 484, Amherst, MA 01004; (413) 545-5993

Region 5 (Berkshires): South Mountain Regional Headquarters, Box 1433, Pittsfield, MA 01202;(413) 784-1828

Geographic Information System (GIS) Coordinator, (617) 727-3160, ext. 545. This office coordinates the use of GIS for programs within DEM; see also listing under EOEA, Massachusetts Geographic Information System.

G.O.A.L.S (Guidelines for Operations and Land Stewardship) Program, (617) 727-3160, ext. 572 or 569. G.O.A.L.S. provides information about the management of natural resource areas and is responsible for preparing management plans for all lands within the State Forest and Park system.

Greenways Program, (413) 586-8706, ext. 18. DEM's Greenways Program promotes the creation of greenways and trails at the local, regional, and state levels. The Program provides information, technical assistance, and coordination services to organizations and communities developing greenways throughout the Commonwealth. DEM also supports the creation and protection of greenways of statewide significance through planning and technical assistance, as well as through direct land protection efforts. Other components of the Greenways Program include coordinating the Massachusetts Greenways and Trails Council, a coalition of organizations interested in promoting, creating, and using greenways throughout the Commonwealth; developing a statewide Greenways and Trails plan for Massachusetts; sponsoring a small grants program (see Appendix I); supporting efforts at protecting and enhancing scenic rivers; and representing DEM in the Federal Energy Regulatory Process for dam relicensing.

Land Acquisition and Protection Program, (617) 727-3160, ext. 551. This Program oversees and coordinates the acquisition and protection of land or interests in land for DEM, and provides technical assistance on the preservation of significant natural, cultural, and historic resources.

Office of Historic Resources, (617) 727-3160 ext. 577. The Office of Historic Resources administers historic and cultural resource planning and related recreation and preservation activities for DEM, including master planning, site and building design, historic property leasing, and municipal technical assistance and grant programs.

Office of Water Resources, (617) 727-3267. The Office of Water Resources oversees the Flood Hazard Management Program, the Lakes and Pond Program, (which includes a small grants program; see Appendix I), and water supply and quality programs.

Trails Program, (617) 727-3180, ext. 655. This program sets standards and guidelines for trail programs and policies within DEM's Forests and Parks system, and coordinates trail maintenance and development projects. It also works closely with DEM's Bikeways

and Greenways programs and coordinates distribution of National Recreational Trails Act funds for recreational trail projects (see Appendix I).

EOEA: Department of Environmental Protection, One Winter Street, Boston, MA 02108; (617) 292-5500.

Community Technical Assistance Program, (617) 292-5931. The aim of this program is to provide technical assistance to municipalities, regional organizations and protection committees, and Boards of Health regarding water supply protection.

Municipal Capacity Building Program, (617) 556-1166. This program employs a technical assistance team to work with municipalities to identify water resources in need of protection. The emphasis is on strengthening local protection and on the adoption of local controls.

Nonpoint Source Pollution Control Program, (508) 366-9181. This program provides general education about nonpoint source pollution and best management practices to interest groups, local officials, and interested citizens. It also offers technical assistance to municipalities to help them implement bylaws, ordinances, and regulations to control activities causing nonpoint source pollution.

Technical Assistance Education, (617) 292-5908. This program conducts technical and regulatory workshops for municipal officials regarding the Wetlands Protection Act.

Underground Storage Tank Program, (617) 292-5886. The Underground Storage Tank Program acts as a clearinghouse of UST information for government officials and the public. It provides copies of studies, leak detection information, or bylaws, and meets with local officials to discuss strategies.

Wetlands Conservancy Program, (617) 292-5704. The Wetlands Conservancy Program provides information on the wetlands registration process and its application to landowners, local officials, and other interested parties. It protects coastal and inland wetland resource areas through Orders of Restriction that regulate, restrict or prohibit certain activities and uses in wetland resource areas.

EOEA: Department of Fisheries, Wildlife, and Environmental Law Enforcement, 100 Cambridge Street, Boston, MA 02202; (617) 727-1614 (general switchboard).

Natural Heritage and Endangered Species Program, Division of Fisheries and Wildlife, Route 135, Westborough, MA 01581; (508) 366-4470, ext 200. Working in cooperation with The Nature Conservancy, the Natural Heritage Program is responsible for collecting and mapping data and for advising agencies on rare and endangered species and habitats. At a municipality's request, it will provide a topographical map of that locale showing critical and significant habitats and rare species of plants and animals.

Riverways Program, (617) 727-1614, ext. 360. The Riverways Program promotes the protection, restoration, and stewardship of the state's rivers, streams, and adjacent lands by providing technical and educational assistance on ways to protect their natural integrity. It encourages and supports local river protection initiatives as a vital complement to state action and serves as an advocate for rivers statewide. It also sponsors the Urban Rivers Small Grants Program which supports projects that revitalize and enhance urban river corridors (see Appendix I).

EOEA: Department of Food and Agriculture, Bureau of Land Use, Old Common Road, Stafford House, Lancaster, MA 01523; (508) 792-7711.

Agricultural Preservation Restriction (APR) Program. The state's APR program provides financial incentives to prevent development of agricultural land. It enables farmers to continue owning and farming their land by purchasing restrictions which protect it from development or other incompatible uses. (See Appendix I for program details.)

Municipal Farmland Identification Program. The Municipal Farmland Identification Program is responsible for mapping all Massachusetts farmlands according to their tax status. It also collects information on whether they are in production full-time and whether they are owned or rented. Communities can use this information to judge the vulnerability and desirability of farmlands for development or conservation.

EOEA: Division of Conservation Services, 100 Cambridge Street, Boston, MA 02202; (617) 727-3160, ext. 292. The Division of Conservation Services was established to act as a liaison between federal, state, and local natural resource programs. It provides assistance on open space planning, reviews and processes conservation restrictions and municipal open space and recreation plans, and directs activities in twelve Conservation District Offices. It also administers three grants-in-aid programs: the Massachusetts Self-Help Program, the Massachusetts Urban Self-Help Program, and the federal Land and Water Conservation Fund (see Appendix I).

EOEA: Massachusetts Geographic Information System (MassGIS), 20 Somerset Street, Third Floor, Boston, MA 02108; (617) 727-5227. MassGIS is responsible for coordinating data exchange among GIS users statewide, providing technical assistance, distributing EOEA GIS data, and increasing public awareness of GIS. It is also involved in developing a trail network database.

EOEA: Massachusetts State Geologist, 100 Cambridge Street, 20th floor, Boston, MA 02202; (617) 727-5830, ext. 305. The State Geologist provides information on geologic resources (e.g., bedrock geology, fault zones, sand and gravel deposits) as well as information on groundwater availability and discharge.

EOEA: Metropolitan District Commission (MDC), 20 Somerset Street, Boston, MA 02108.

Office of Planning, (617) 727-9693. This office is responsible for overseeing park and greenway planning for the MDC, which protects over 18,000 acres of parkland and 700 lane-miles of landscaped parkways and bridges in the greater Boston area.

Watershed Management Division, (617) 727-5274. The Watershed Management Division is responsible for managing and protecting land around the Quabbin, Wachusett, Ware River, and Sudbury River watersheds to protect drinking water supplies.

Executive Office of Transportation and Construction (EOTC), Massachusetts Highway Department (MHD), Bureau of Transportation Planning and Development, 10 Park Plaza, Room 4150, Boston, MA 02116; (617) 973-7313.

Bicycle-Pedestrian Coordinator, (617) 973-7329. This program is responsible for MHD and EOTC bicycle and pedestrian planning and works closely with DEM's Bikeways Program, RPAs, localities, and organizations to design and implement new projects. In 1997, this Program completed statewide bicycle and pedestrian transportation plans.

Landscape Architecture Supervisor, (617) 973-7738. This office plans, designs, and reviews the landscape architecture components of transportation improvement projects, including bikepaths, parks, scenic byways, intermodal facilities, and rest area/information centers.

Scenic Byways Program, (617) 973-7313. The Scenic Byways Program encourages the protection of open space resources through the creation of corridor management plans for designated roadways. It also provides information on scenic byway designations and acquisitions.

Transportation Equity Act for the 21st Century (TEA-21) Enhancement Coordinator, (617) 973-7312. The TEA-21 Enhancement Coordinator develops guidelines, reviews projects, and makes recommendations on all TEA-21 enhancement projects, including the development of bicycle and pedestrian facilities and the preservation of railroad corridors. It also assists in scenic byway acquisitions and other land protection programs within MHD. See Appendix I for a description of federal grant disbursements to local projects.

Office of the Secretary of State, Massachusetts Historical Commission (MHC), 80 Boylston Street, Boston, MA 02116; (617) 727-8470. MHC provides information on historical and archeological resources and reviews projects which impact historical resources. It also sponsors the Massachusetts Preservation Project Fund for work on sites on the State or National Registers of Historic Places (see Appendix I).

University of Massachusetts/Amherst, Amherst, MA 01003.

Cartographic Information Research Services (CIL), 102-D Hasbrouck Laboratory, (413) 545-0359. CIRS assists in locating various kinds of maps and cartographic information, including aerial photographs. Staff provide technical assistance and advice to users in the selection of appropriate data and maps for their applications. CIRS also sells maps and will order data or maps from the appropriate sources and arrange for delivery to the user. CIRS is the Massachusetts affiliate of the National Cartographic Information Center, a division of the U.S. Geological Survey, Department of the Interior.

Center for Rural Massachusetts (CRM), Hills North, (413) 545-0153. In cooperation with the Department of Landscape Architecture and Regional Planning and the Center for Economic Development, CRM provides technical assistance on planning and land-use issues for small and rural towns.

Cooperative Extension Service, see separate listing under State Government Offices.

Resource Mapping/Land Information Systems, Department of Forestry and Wildlife Management, Holdsworth Natural Resources Center, (413) 545-3589. This program works on a wide variety of natural resource mapping projects, but its main focus is on land use/land cover mapping for Massachusetts using GIS (ARC/INFO system).

FEDERAL GOVERNMENT OFFICES

United States Department of Agriculture, Natural Resource Conservation Service, Massachusetts State Office, 451 West Street, Amherst, MA 01002-2995; (413) 253-4350. The Natural Resource Conservation Service (NRCS)—formerly the Soil Conservation Service—provides technical information pertaining to soil, water, and related resources, including soil classification maps and descriptions. Contact the appropriate regional field office.

Barnstable: P.O. Box 709, Flint Rock Road, Barnstable, MA 02630; (508) 362-9332

Greenfield: Hayburne Building, Room 120, 55 Federal Street, Greenfield, MA 01301; (413) 772-0384

Holden: 52 Boyden Road, Room 100, Holden, MA 01520-2587; (508) 829-6628

Northampton: Potpourri Mall, 243 King Street, Room 39, Northampton, MA 01060; (413) 586-5440

Pittsfield: 78 Center Street (Arterial), Pittsfield, MA 01201; (413) 443-6867

West Wareham: 15 Cranberry Highway, West Wareham, MA 02576; (508) 295-7962

Westford: 319 Littleton Road, Westford, MA 01886; (978) 692-1904

United States Department of the Interior (USDOI)

USDOI: National Park Service, 15 State Street, Boston, MA 02109;

Rivers and Trails Program, (617) 223-5210; www.nps.org. The Rivers and Trails Program works beyond the boundaries of National Parks to provide conservation assistance to municipal, county, and state governments, non-profit groups, and landowners. It serves as a catalyst and facilitator, offering a national perspective on how to establish trail systems, greenways, and river corridor protection programs. Rivers and Trails projects range from statewide river assessments to plans for a single river or urban waterfront.

USDOI: United States Geological Survey (USGS)

Map Distribution Center, Federal Center Building 41, Box 25286, Denver, CO 80229. This USGS center sells both U.S. Quadrangle Topographic maps and U.S. Geologic Quadrangle maps.

NOTE: Topographic maps, digital data information, and aerial photo information can also be ordered by mail by calling 1-800-USA MAPS. All USGS maps are \$4.00. This is an automated ordering service accepting credit card payment.

National Cartographic Information Center, see Cartographic Information Research Service listed under State Government Offices/University of Massachusetts at Amherst.

See also the listing for Cooperative Extension Service under State Government Offices.

NATIONAL, STATEWIDE, AND REGIONAL NONPROFIT ORGANIZATIONS

American Farmland Trust, 1920 N Street, NW, Suite 400, Washington, D.C. 20036; (202) 659-5170; www.farmland.org. The American Farmland Trust undertakes a range of activities throughout the nation to protect agricultural land. It provides technical assistance to localities implementing agricultural land preservation strategies and directly protects farms by acquisition or other means.

The American Greenways Program, The Conservation Fund, 1800 North Kent Street, Suite 1120, Arlington, VA 22209; (703) 525-6300; www.conservationfund.org. The American Greenways Program of The Conservation Fund strives to establish a nationwide network of public and private open space corridors. The program serves as an umbrella organization promoting the greenways concept at the national, state, and local levels. It provides information and technical assistance on all aspects of greenway planning and development. It also sponsors a small grants program (see Appendix I) and assists in acquiring land for greenways.

American Hiking Society, P.O. Box 20160, Washington, D.C. 20041-2160; (703) 385-3252; www.americanhiking.org. The American Hiking Society is dedicated to protecting the interests of hikers and preserving America's footpaths. It encourages volunteerism in trail building and maintenance through work trips and it maintains a public information service to provide hikers and other trail users with facts regarding facilities, organizations, and how to make best use of trails while protecting the environment.

American Rivers, 801 Pennsylvania Ave, SE, Washington, D.C. 20003; (203) 547-6900; www.american-

rivers.org. American Rivers is the nation's river-saving organization and the only national nonprofit devoted exclusively to preserving the nation's outstanding rivers and their landscapes.

Appalachian Mountain Club (AMC), 5 Joy Street, Boston, MA 02108; (617) 523-0636; www.outdoors.org. The Appalachian Mountain Club is a nonprofit organization which promotes the protection, enjoyment, and wise use of the open spaces, rivers, mountains, and forests of the Northeast. In addition to sponsoring workshops and trips, it publishes books on establishing and maintaining trails, organizing outdoor volunteers, as well as numerous trail guides.

Associated Grantmakers, 294 Washington Street, Suite 840, Boston, MA 02108; (617) 426-2606; www.agm-connect.org. Associated Grantmakers is a philanthropic resource center designed for use by individuals and nonprofit organizations. It maintains an extensive library of grant sources and foundations which is available on a walk-in basis. Every three years, Associated Grantmakers publishes *Profiles of Massachusetts Grantmakers* which lists Massachusetts foundations and organizations that are sources of grant funds. Nationally-focused directories are also available.

Association for the Preservation of Cape Cod, Inc. (APCC), P.O. Box 636, Orleans, MA 02653; (508) 255-4142; www.apcc.org. APCC conducts research and educational programs on the Cape Cod environment and makes its studies, reports, lectures, and slide shows available to area communities.

Bay Circuit Alliance, 3 Railroad Street, Andover, MA 01810; (508) 470-1082; www.serve.com.baycircuit. This nonprofit advances the goals of the Bay Circuit Trail, which stretches from Plum Island in Newburyport around the Greater Boston area to Bay Farm in Duxbury. Its efforts are focused on land protection and acquisition to ensure the integrity of the trail and to link noncontiguous parcels.

Berkshire Natural Resources Council, 20 Bank Row, Pittsfield, MA 01201; (413) 499-0596; www2.shore. net/~mltc/demo/TEXT/NEARTRUST/landtrusts/berkshire.html. This advocacy organization represents environmental concerns in the Berkshires. It also maintains the Berkshire County Land Trust and Conservation Fund and helps private landowners develop land conservancy programs.

The Environmental League of Massachusetts, 3 Joy Street, Boston, MA 02108; (617) 742-2553; www.environmentalleague.org. The Environmental League works for the protection of natural resources in Massachusetts through legislative action and offers interpretation of and information on Massachusetts land-use laws.

Land Trust Alliance, 900 17th Street, NW, Suite 410, Washington, D.C. 20006; (202) 785-1410; www.lta.org. This national organization of land trusts provides specialized services, publications, and training for land trusts and other land conservation organizations.

Massachusetts Association of Conservation Commissions, Inc. (MACC), 10 Juniper Road, Belmont, MA 02178; (617) 489-3930. MACC is a voluntary association of the Conservation Commissions in Massachusetts dedicated to the education of commission members. It assists municipal commissions through planning-related workshops, production of a newsletter, and providing information and advice. It also offers a hot-line service directing callers to the appropriate member of its Board of Directors, whose services are available at typical consultant rates.

Massachusetts Audubon Society, South Great Road, Lincoln, MA 01773; (781) 259-9500; www.massaudubon.org. The Massachusetts Audubon Society is a nongovernmental, membership-supported conservation, environmental education, and research agency concerned with the preservation of a healthy environment for humans and wildlife. It manages more than 12,000 acres in sanctuaries and reservations throughout the state, offers adult and youth courses in natural history and conservation, conducts scientific research especially in relation to plant and animal ecology, publishes the Sanctuary newsletter and informational leaflets, and organizes naturalist-led field trips to its properties. Its education department also provides a variety of services, including a center to train and consult with teachers in environmental education and an extensive collection of resource materials.

Massachusetts Land Trust Coalition, c/o The Trustees of Reservations, 572 Essex Street, Beverly, MA 01915; (978) 921-1944; www2.shore-net/~mltc/demo/text/ NEARTRUST/list.html. This organization provides information and coordination services to land trusts throughout the Commonwealth.

The Nature Conservancy (TNC), Eastern Regional Office, 79 Milk St. Ste. 300, Boston, MA 02110; (617)

423-2545; www.tnc.org. The Nature Conservancy is a national organization that identifies important habitats, unique natural features and resources, and rare and endangered species, and advises and assists in their management and protection.

Rails-to-Trails Conservancy, 1400 16th Street, NW, Washington, D.C. 20036; (202) 797-5400; www.rail-trails.org. Rails-to-Trails is a nationwide nonprofit that helps local governments and organizations convert abandoned railroad rights-of-way into public recreational trails.

Scenic America, 21 Dupont Circle, NW, Washington, D.C. 20036; (202) 833-4300; www.scenic.org. This national organization devoted to preserving America's scenic beauty provides information and technical assistance on ways to identify, designate, and protect scenic road corridors in both urban and rural areas.

Trails and Greenways Clearinghouse, 1100 17th Street, NW, 10th Floor, Washington, DC 20036; 202-974-5123, www.trailsandgreenways.org. The Trails and Greenways Clearinghouse provides technical assistance, information resources, and referrals to trail and greenway advocates and developers across the nation. Clearinghouse services are free and available to individuals, government agencies, communities, grassroots organizations, and anyone else who is seeking to create or manage trails and greenways. The Clearinghouse is a Partnership of the Rails-To-Trails Conservancy and The Conservation Fund.

The Trust for Public Land (TPL), 33 Union St., Boston, MA 02108; (617) 367-6200. The Trust for Public Land is a national organization formed to help public agencies and communities acquire land of recreational, cultural, and ecological value. It is involved in numerous greenway projects, particularly in urban areas, and also helps to set up local land trusts.

The Trustees of Reservations (TTOR), 572 Essex Street, Beverly, MA 01915; (978) 921-1944; www.berk-shireweb.com/trustees. TTOR preserves, for public use and enjoyment, properties of exceptional scenic, historic and ecological value in Massachusetts. It also advises communities and other land trusts on assessing conservation requirements and devising strategies to meet them.

REGIONAL PLANNING AGENCIES (RPAS)

Note: RPAs offer a variety of services to their member communities, including technical and research assistance in such areas as planning, open space protection, recreation, water resources, and growth management. It is suggested you call the agency office nearest you to find out the kinds of support and assistance it can provide.

Berkshire County Regional Planning Commission, 10 Fenn Street, Pittsfield, MA 01201; (413) 442-1521

Cape Cod Commission, 3225 Main Street, P.O. Box 226, Barnstable, MA 02630; (508) 362-3828

Central Massachusetts Regional Planning District Commission, 340 Main Street, Room 747, Worcester, MA 01608; (508) 756-7717

Franklin County Planning Commission, 425 Main Street, Greenfield, MA 01301; (413) 774-3167

Martha's Vineyard Commission, Box 1447, Oak Bluffs, MA 02557; (508) 693-3453

Merrimack Valley Planning Commission, 350 Main Street, Haverhill, MA 01830; (978) 374-0519

Metropolitan Area Planning Council, 60 Temple Place, Boston, MA 02111; (617) 451-2770

Montachusett Regional Planning Commission, R1427 Water Street, Fitchburg, MA 01420; (978) 345-7376

Nantucket Planning and Economic Development Commission, One East Chestnut Street, Nantucket, MA 02554; (508) 228-7237

Northern Middlesex Council of Governments, 115 Thorndike Street, Lowell, MA 01852; (978) 454-8021

Old Colony Planning Council, 70 School Street, Brockton, MA 02401-4097; (508) 583-1833

Pioneer Valley Planning Commission, 26 Central Street, West Springfield, MA 01089; (413) 781-6045

Southeastern Regional Planning and Economic Development District, 88 Broadway, Taunton, MA 02780; (508) 824-1367

TRAILS ORGANIZATIONS

Note: The following is a partial list of private nonprofit trail organizations in Massachusetts. These are in addition to the many conservation groups, land trusts, and state agencies that have an active interest in trails. Please review the other sections of this Appendix for additional sources of information relating to trail establishment, use, maintenance, and management. Where possible, the name and phone number of a contact person has been included.

Appalachian Mountain Club, Trails Program: Kevin Knobloch, 5 Joy Street, Boston, MA 02108; (617) 523-0636; www.outdoors.org

Bay State Trail Riders: Becky Kalagher, 24 Glenn Street, Douglas, MA 01516; (508) 476-3960

Cape Cod Trails Conference: Patrick Kimball, 81 Maple Lane, Brewster, MA 02631; (508) 255-3717

Cross State Trail Riders: Patricia O'Neil, 435 Martin's Pond Road, Groton, MA 01450; (978) 448-6370

Essex County Trail Association: Sussanna Colloredo, Winthrop Street, South Hamilton, MA 01982; (978) 468-3310

Friends of the Warner Trail: Mead Bradner, 30 Water Street, Foxboro, MA 02035; (508) 543-2633

Metacomet-Monadnock Trail: Pat Fletcher, 20 Linda Drive, Westfield, MA 01085

Midstate Trail Committee: Bob and Leah Devine, 15 Hawthorne Street, Millbury, MA 01527; (508) 752-3537

New England 4-Wheelers Club, Inc.: Richard Banfield, 12B Mendon Street, Hopedale, MA 01747; (508) 478-1608

New England Horse and Trail Association: Patricia O'Neil, 435 Martin's Pond Road, Groton, MA 01450; (978) 448-6370

New England Mountain Bike Association: Heidi Davis, 69 Spring Street, Cambridge, MA 02141; (617) 497-6891; www.nemba.org

New England Trail Conference: Forrest E. House, 33 Knollwood Drive, East Longmeadow, MA 01028 New England Trail Riders Association: Gerry Leary, 189 Wood Street, Lexington, MA 02173; (617) 862-2824

Pioneer Valley Trail Conference: Bruce Scofield, P.O. Box 561, Amherst, MA 01004; (413) 253-9450

Seven Hills Wheelmen: Karen Saltus, P.O. Box 24, Worcester, MA 01606; (508) 845-5571

Snowmobile Association of Massachusetts: Tom Lively, P.O. Box 55, Heath, MA 01346; (413) 337-4061

Southern New England Trail Conference: Bill Perry, 300 Putnam Hill Road, Sutton, MA 01590; (508) 865-6123

Taconic Hiking Club: Katherine Wolfe, 45 Kakely Street, Albany, NY 12208; (518) 447-7569

WATERSHED ASSOCIATIONS

Note: This list of watershed associations includes groups that are registered 501(c)(3) nonprofit organizations with full-time staff as well as groups with no organized structure that are run entirely by volunteers. This spectrum has been included because in the context of greenway activities both types of associations may be valuable sources of information and assistance. Wherever possible, the name of a contact person has also been included.

Back River Committee: Thomas Burbank, 17 Andrews Isle, Hingham, MA 02043; (781) 749-9473

Back River Protection Association: Barbara Johnson, 41 Massasoit Road, North Weymouth, MA 02191; (781) 337-3896

Blackstone River Watershed Association: Margaret Lavalee, 14 Oales Street, Millbury, MA 01527; (508) 752-3444 or Memorial Town Hall, Whitinsville, MA 01588; (508) 234-8797

Canoe River Aquifer Advisory Committee: Joan Sozio, 25 Eastman Avenue, Foxborough, MA 02035; (508) 543-2418

Charles River Watershed Association: Bob Zimmerman, 2391 Commonwealth Avenue, Newton, MA 02166; (617) 527-2799

Chicopee River Watershed Council: Karl Bergman, P.O. Box 148, Chicopee, MA 01014; (413) 594-4468

Concord River: Bob Thorlton, 10 Albert Road, Billerica, MA 01821; (978) 670-5328

Connecticut River Watershed Council: Tom Miner, One Ferry Street, Easthampton, MA 01027; (413) 529-9500

Deerfield River Compact: Jane Peirce, 64 South Shore Drive, Orange, MA 01364; (508) 544-2681

Deerfield River Watershed Association: Bambi Miller, Maple Terrace, Charlemont, MA 01334; (413) 339-5333 or P.O. Box 13, Shelburne Falls, MA 01370; (413) 625-9602

Destruction Brook: Nancy Crosby, P.O. Box 13, Dartmouth, MA 02714; (508) 636-3934

Farmington River Watershed Association, 749 Hop Meadow Street, Simsbury, CT 06070; (203) 658-4442

Five Mile River: Tom LeClaire, 27 Shore Road, North Brookfield, MA 01535; (508) 867-3870 or Peggy Middaugh, 27 Ashley Drive, North Brookfield, MA 01535; (508) 867-9491

Fore River Watershed Association: Katie Barrett, P.O. Box 2356, Quincy, MA 02269

Framingham Advocates/Sudbury River: Matt Zettek, 83 Central Street, Framingham, MA 01701; (508) 877-7827

French River Watershed Association: Ruth Kaminski, 25 Moose Hill Road, P.O. Box 479, Leicester, MA 01524; (508) 892-3121

Friends of Back River: Cecelia DiCicco, 61 Broad Reach, T-31B, North Weymouth, MA 02191; (781) 335-4869

Friends of Cole and Lee Rivers: Allan & Judy Conaway, 167 Seaview Avenue, Swansea, MA 02777; (508) 672-9399

Friends of Fish Brook: Nancy Merrill, 20 Cross Street, Boxford, MA 01921; (978) 887-2194

Friends of Old Swamp River: Bob Loring, 640 Union Street, South Weymouth, MA 02190; (781) 337-4292

Friends of the Squannacook: Dorian Bertram, 8 Balsam Drive, Townsend, MA 01469; (978) 597-6437

Friends of the Williams River: Gene Chague, 93 East Street, Lenox, MA 01240; (413) 443-4421

Green River Watershed Preservation Alliance: Mike Fair, New County Road, Colrain, MA 01340

The Gulf Association: John Hartshorne, 115 Border Street, Cohasset, MA 02025; (781) 383-0317 or P.O. Box 140, North Scituate, MA 02060

Hands Across the River (Acushnet): Barry Starr, 16 Elizabeth Street, New Bedford, MA 02740; (401) 245-9454

Hoosic River Watershed Association: Lauren Stevens, P.O. Box 667, Williamstown, MA 01267; (413) 458-9841

Housatonic River Initiative: Dennis Regan, 124 Kellogg Road, Sheffield, MA 01257; (413) 229-8569

Housatonic Valley Association: Tom Stokes, Woods Pond, P.O. Box 1885, Lenox, MA 01240; (413) 637-3188

Ipswich River Watershed Association, Inc.: Kerry Mackin, c/o MAS Ipswich River Wildlife Sanctuary, 87 Perkins Row, Topsfield, MA 01983; (978) 887-8597

Jones River Watershed Association: Deborah McKie, P.O. Box 7, Kingston, MA 02364; (781) 585-0702

Konkapot River Advisory Committee: Martin Keane, P.O. Box 288, Ashley Falls, MA 01222; (413) 229-7988

Lampson Brook Watershed Association: Judith Gillan, New England Small Farms Institute, P.O. Box 937, Belchertown, MA 01007; (413) 323-6821

Leesville Pond Watershed Association: Joan Crowell, 5 Bernice Street, Worcester, MA 01603; (508) 754-1074

Massachusetts Watershed Coalition: Ed Himlan, 10 Monument Square, P.O. Box 577, Leominster, MA 01453; (978) 534-0379; www.ultranet.com/~mwc

Merrimack River Watershed Council: Ralph Goodno, P.O. Box 1377, 56 Island Street, Lawrence, MA 01842; (978) 681-5777

Millers River Watershed Council: Henry Waidlich, Mineral Road, Millers Falls, MA 01349; (413) 659-3497

Mystic River Watershed Association: Stewart Sanders, 73 Fairmont Street, Belmont, MA 02178; (617) 489-3120

Nashua River Watershed Association: Elizabeth Campbell, 592 Main Street, Groton, MA 01450; (978) 448-0299

Neponset River Watershed Association: Ian Cooke, 2438 Washington Street, Canton, MA 02021; (781) 238-0693

North and South Rivers Watershed Association: Debbie Lenehan, Box 43, Norwell, MA 02061; (781) 784-8168

Organization for the Assabet River: Sally Murray, Damon Mill Square, Concord, MA 01742; (978) 369-3956

P.O.N.D. Shingle Island River: Ruth Lucardi, P.O. Box 252, North Dartmouth, MA 02747; (508) 995-8969

Palmer River Watershed Alliance: Michelle McAlpin, 85 Chestnut Street, Rehoboth, MA 02769

Parker River: David Mountain, 5 Larkin Road, Newbury, MA 01950; (978) 462-5148

Quaboag River: Richard Elliott, 113 Butler Road, Monson, MA 01057; (413) 362-5450

Quashnet River: c/o Cape Cod Trout Unlimited, Box 67, Falmouth, MA 02541

Quinebaug Rivers Association: Roger Hunt, 20 Kenilworth Road, Worcester, MA 01602; (508) 755-4917

Restore Olmsted's Waterway (ROW) Coalition (Muddy River): Irene Gillis, 163 Kent Street, Brookline, MA 02146; (617) 731-1341

Running River/Pokanoket Watershed Alliance: Doug Rayner, 88 Prospect Street, Barrington, RI 02806; (401) 246-1326

Saugus River Watershed Association: Cindy Del Papa, One Eliot Circle, Revere, MA 02151; (781) 284-1073

Saugus River Watershed Council: Mary Kinsell, P.O. Box 1092, Saugus, MA 01906; (781) 233-4330

Sawmill River Alliance: Don Ogden, P.O. Box 35, Montague, MA 01351; (413) 367-9352

Shawsheen River Environmental Action Team: Bob Rauseo, 682 Chandler Street, Tewksbury, MA 01876; (978) 851-9505

Spickett River Watershed Association: Joe Cosgrove, Town Hall, Planning Department, 90 Hampshire Street, Metheun, MA 01844; (978) 794-3231

Stony Brook Watershed Association: Ginny Scarlett, 100 Depot Road, Boxboro, MA 01719; (978) 263-5710

SuAsCo Watershed Association: Mike Meixsell, 34 Barton Drive, Sudbury, MA 01776; (978) 443-6959

Tatnuck Brook: Dan Dick, 41 Iroquois Street, Worcester, MA 01602; (508) 756-9292

Taunton River Watershed Alliance: 20 Scotland Park, Suite 2A, Bridgewater, MA 02324; (508) 697-5700

Ten Mile River Watershed Alliance: Clyde & Nancy Sprague, 38 Westwood Park Circle, Attleboro, MA 02703; (508) 226-2062

Upper Ware River Watershed Association: Charlie Chase, Town Hall/Board of Selectmen, Barre, MA 01005; (978) 355-6664

Ware River Preservation Society: Annette Haley, 133 Emery Street, Palmer, MA 01069; (413) 283-8808

Water Supply Citizen Advisory Committee: Alexandra Dawson & William Elliott, 138 Russell Street, P.O. Box 478, Hadley, MA 01035; (413) 586-8861

Westfield River Watershed Association: Robert Bristow, Westfield State College, Geography & Regional Planning, Westfield, MA 01086; (413) 568-3311

Westport River Watershed Alliance: Gay Gillespie, P.O. Box 3427, 1151 Main Road, Westport, MA 02790; (508) 636-3016

LIST OF ACRONYMS FOR GOVERNMENTAL OFFICES AND PROGRAMS

ACEC: Area of Critical Environmental Concern

ALA: Aquifer Land Acquisition Program, within DEP

APR: Agricultural Preservation Restriction program, within DFA

DCS: The Division of Conservation Services, within EOEA

DEM: The Department of Environmental Management, within EOEA

DEP: The Department of Environmental Protection, within EOEA

DFA: The Department of Food and Agriculture, within FOFA

DFW: The Division of Fisheries and Wildlife, within DFWELE

DFWELE: The Department of Fisheries, Wildlife, and Environmental Law Enforcement, within EOEA

EOEA: Executive Office of Environmental Affairs

EOTC: Executive Office of Transportation and Construction

GIS: Geographic Information System

G.O.A.L.S.: Guidelines for Operations and Land Stewardship program, within DEM

MACC: Massachusetts Association of Conservation Commissions

MassGIS: Massachusetts Geographic Information System, at EOEA Data Center

MCZM: Massachusetts Coastal Zone Management, within EOEA

MDC: Metropolitan District Commission, within EOEA

MGL: Massachusetts General Laws

MHC: Massachusetts Historical Commission, within the Office of the Secretary of State

MHD: Massachusetts Highway Department, within EOTC

RPA: Regional Planning Agency

TEA-21: Transportation Equity Act for the 21st Century

UMass: University of Massachusetts at Amherst

USDA: United States Department of Agriculture

USGS: United States Geological Survey, within the U.S. Department of the Interior



APPENDIX C

The Massachusetts Watershed Initiative

Wenty-five years after passage of the Federal Clean Water Act, a number of Massachusetts' inland and coastal waters are still not fishable or swimmable. Most contamination from point sources, such as municipal and industrial wastewater discharges, has been or is presently being addressed. Nonpoint sources of pollution, such as stormwater runoff and discharges from failed septic systems, are presently the primary cause of poor water quality and are adding to the contamination of sediments. The diminished quality of these water resources has resulted in environmental and economic impacts to the Commonwealth.

A new frame of reference for decision making is needed to improve the quality of Massachusetts' waters and to achieve other environmental goals, such as fisheries and wildlife habitat protection and restoration and improved public access. The watershed is proposed to serve as this frame of reference. A watershed is the geographic area within which surface and ground water flows to a common point. Whatever goes into the water upstream flows down-

stream. By making the watershed the context for decision making, regional perspectives based on natural resource factors can be considered in environmental assessment and planning, and in the implementation of protection and restoration measures.

The Massachusetts Watershed Initiative was launched in December, 1993 at a special forum of environmental, business, municipal and government interests. The forum called for a working group, the *Watershed Initiative Steering Committee* (WISC), to develop a model approach, or methodology, for watershed-based environmental assessment, planning, and decision making, to get at the ever-elusive nonpoint sources and other intractable environmental problems.

Central to the success of the watershed approach is a shift from top-down, federal- and state-driven environmental management to bottom-up, locally focused environmental management. The watershed vision has municipal governments, businesses, and citizens joining with watershed associations in becoming actively engaged in preventing and remediating environmental pollution in their own back yards and neighborhoods. Each are full partners in prioritizing needs. Limited federal, state, municipal and private dollars are targeted to the locally determined priorities. The goal is protection and restoration of environmental quality, including restoration of Massachusetts' waters to fishable and

swimmable quality.

The WISC developed the Watershed Management Methodology based on the results of the Neponset River Watershed Pilot Project as well as the experience of other watershed projects. The methodology is both a structure and process by which each of the Commonwealth's watersheds can implement a



Washington Mountain Brook.

watershed-based approach to environmental assessment, planning, and decision making. It is intended to be flexible, to take advantage of the unique opportunities and conditions in each watershed. With the inauguration of the methodology for statewide implementation, the WISC membership was formalized by the Secretary of Environmental Affairs and WISC advises the statewide implementation of the methodology.

The suggested structure for individual watersheds puts citizens in both leadership and supporting roles in the collection of data, setting of priorities, and implementation of environmental solutions. It is envisioned that a committee of the diverse interests, or "stakeholders", called the Watershed Community Council, would be convened to oversee watershed management in the watershed. The Watershed Community Council may designate a Technical Advisory Committee and Outreach and Education Committee. Municipal governments and businesses would be active participants on the Watershed Community Council and Subwatershed "Stream Teams" made up of the various stakeholders. The Council and Stream Teams would offer a forum for interaction and mutual decision making that has been lacking. Stream Teams would perform shoreline surveys and other local assessments of environmental quality. Watershed Teams, made up of state and federal agency staff, will perform watershed-wide water quality and habitat assessments for use by the Watershed Community Council and Stream Teams in watershed planning.

The process of watershed management is seen as consisting of a series of four steps, each building on the other and carried out in an ongoing fashion by the Watershed Community Council, Stream Teams, Watershed Teams, municipal governments, and businesses. The steps are: outreach, education, and technical assistance; resource assessment; water resources planning; and plan implementation (including permitting, compliance and enforcement). Through these steps, watershed stakeholders will collaborate in the identification of environmental problems, and in the development of Watershed Action Plans. The Action Plans describe protection and restoration measures, assign responsibilities for these measures, and set forth a schedule for implementation.

The WISC also developed a *Statewide Implementation Strategy* for the methodology. The first component of this strategy is "The Massachusetts Guide to Watershed Management", which explains to watershed stakeholders how to implement the methodology.

The second component of the strategy is to provide some funding and technical assistance to expedite watershed management. Watersheds will be readied to implement the Watershed Management Methodology through state assistance and some watershed matching

funds. Two types of state financial assistance are in place: (1) "capacity building grants", for watersheds whose stakeholders will benefit from education about watershed concepts and the watershed approach; and (2) "comprehensive grants," for watersheds which are ready to establish the structure and commence the process of watershed management. (See Appendix I for more information on these programs.)

The third component of the strategy is EOEA's reorientation of the environmental agencies to serve watershed-based decision making. The state agency reorientation toward the watershed approach is an important component of EOEA's regulatory and programmatic streamlining initiative, to achieve "more protection with less process". The final component of the strategy is the provision of technology services to watersheds. The services will include water resource modeling, data analysis, and Geographic Information System (GIS) mapping. In addition, EOEA has assigned a staff person to each watershed to help develop and lead a watershed team.

As we create real partnerships through implementation of the watershed approach, we will expand our collective ability to protect and improve environmental quality. If each and every stakeholder gives a little, the environmental and economic return for Massachusetts will be great. For more information about the Watershed Initiative and for the name and phone number of the watershed team leader in your area, contact EOEA's watershed office at (617) 727-1800 ext. 412.

—from the Executive Summary, "Massachusetts Watershed Approach and its Implementation: Status Report", October 1995

APPENDIX D

State Land and Resource Protection Programs and Laws

EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS (EOEA) LAND PROTECTION PROGRAMS

Four state agencies within EOEA administer land acquisition programs to protect a wide variety of critical natural, cultural, and recreational resources of statewide significance. The Department of Environmental Management (DEM) acquires land for state forests, parks, cultural sites, and critical resource protection; the Department of Fisheries, Wildlife, and Environmental Law Enforcement (DFWELE), with the Division of Fisheries and Wildlife (DFW), focus on habitat protection; the Metropolitan District Commission (MDC) addresses open space and park needs within the Greater Boston area, and watershed protection for safe and reliable drinking water; and the Department of Food and Agriculture (DFA) is responsible for the protection and preservation of agricultural lands. For more information on these programs contact DEM (617) 727-3160; DFWELE (617) 727-1614; DFW (617) 727-3151; MDC (617) 727-5294; and DFA (508) 792-7711. (Also see Appdenix I, Division of Conservation Services, which provides grants to municipalities for land acquisition and protection.

PURCHASE OF DEVELOPMENT RIGHTS (PDR)

Purchase of Development Rights is an acquisition technique used primarily to protect farmland. The basic premise upon which PDR programs are based is that a landowner maintains a "bundle" of property rights, some or all of which may be severed from the land and sold or donated. When a property owner sells a piece of land outright, he or she is selling the entire package and the value of the land is based on the ability to exercise all of these rights. In PDR programs, a local or state government purchases the development rights to

a property, but the title of the parcel remains with the owner. The amount of money paid to the landowner is the difference between the market value of the land if it were developed to its fullest potential under local zoning ordinances, and its actual use value, most commonly its agricultural value. Selection criteria for PDR programs include the size of the parcel and contiguity with other farmland, the severity of development pressures, soil type and quality, geographic location, and the cost of the development rights. Once the development rights are sold, a restriction is placed in the deed which runs with the land in perpetuity.

The use of PDR programs provides benefits to both the farmer and the local community and is generally seen as more acceptable — or at least more politically feasible — than agricultural zoning or other regulatory programs. The acquisition of the development rights is also considerably less expensive than full fee acquisition, and the land remains on the tax roles, although at a reduced rate given its lower market value because of the development restrictions. Because property taxes are based on land values, a reduction in value reduces the amount of property taxes a participating landowner must pay. In addition to reduced taxes, many farmers invest the funds received for their development rights into farm equipment or supplies, helping not only their own operation but often bolstering the regional agricultural economy as well. PDR programs also protect agricultural land from development pressures and fluctuations in the real estate market. This helps to maintain agriculture as an economicallyviable use of the land, especially in urban fringe communities.

An obvious disadvantage of these types of programs is the high cost associated with purchasing development rights, especially in areas where real estate values are high. This severely limits the extent to which this technique may be used. In addition, while the parcels that are protected will remain open, there is no guarantee they will remain in active agricultural

use. Furthermore, a number of farmers view their land as their retirement nest egg and wish to retain the right to sell their land at full market value rather than participate in PDR programs.

In Massachusetts, the Agricultural Preservation Restriction (APR) program purchases the development rights of farmland across the Commonwealth. The program is voluntary and an interested farmer must submit an application to the Department of Food and Agriculture (DFA) for consideration. If selected, the Commonwealth pays the landowner the difference between the land's fair market value and its agricultural value. The farmer retains ownership of the land with a permanent deed restriction preventing future development. This restriction prohibits all activities that are detrimental to the present or potential agricultural use of the land. Massachusetts farmers have shown considerable interest in the APR Program, and the state holds APRs on over 30,000 acres of farmland. However, funding for the program is limited and it is unlikely that it will ever be able to purchase the development rights of all of the prime farmland in Massachusetts. Instead, such programs must be coupled with effective local land-use controls such as the establishment of agricultural preservation overlay districts. For more information about the APR Program contact the Department of Food and Agriculture, Bureau of Land Use, Old Common Road, Stafford House, Lancaster MA, 01523; (508) 792-7711.

PREFERENTIAL TAXATION PROGRAMS

Preferential or use-value assessment is another voluntary mechanism designed to help interested landowners keep their land open by reducing the amount of property taxes they must pay. Programs are set up under state laws which enable eligible parcels to be assessed at their value as agricultural, forest, recreational, or open lands, rather than as potentially developable parcels. A lower assessed value translates into a reduction in property taxes, helping to minimize the financial burden of not developing the land. This tax break can be quite substantial in areas where development pressures and land values are high.

In Massachusetts, use-value taxation programs have been created under Massachusetts General Laws (MGL) Chapters 61, 61A, and 61B for forest, farm, and recreational lands, respectively. Under these programs, landowners may apply to their local tax assessor for current-use valuation. These voluntary programs are available to any landowner, provided that his or her property meets the criteria specified in the laws.

Chapter 61: Forest Land Assessment Act

This Act permits woodlands to be assessed at their value as forests, provided the property consists of at least ten contiguous acres of forested land. The landowner must also have a state-approved, ten-year management plan for the acreage under consideration. Program participants are required to pay property taxes based on the use value of the parcel, and a products tax on materials harvested from the land. In addition, all structures and associated lands within the forest parcel are assessed at their fair market value.

Participation in this program is voluntary and landowners may withdraw their properties at any time. However, if a property owner chooses to withdraw, he is required to pay a penalty equal to the difference between the taxes that would have been owed if the property wasn't under special assessment for the previous five years, and the property and products taxes actually paid.

Chapter 61A: Farmland Assessment Act

Similar to the Forest Land Assessment Act, this law allows farmland to be assessed based on its agricultural and horticultural value. Landowners with five or more acres of active farmland may participate in this program, provided that their property has been in agricultural or horticultural use during the assessment year and during the two preceding years. In addition, the land must generate at least \$500 of farm-related income per year; parcels larger than five acres must bring in an additional \$5 per acre. The rate at which agricultural lands are assessed varies depending on the use, although there is usually at least a fifty percent reduction in value. This translates into significant tax benefits for farmers.

If the farmer decides to sell the land for non-agricultural purposes or to withdraw from the program, he or she must pay a conveyance or roll-back tax, whichever is greater. A conveyance tax is assessed at the time of sale and is based on the sale price of the farmland. Roll-back taxes are the penalties charged for withdrawing from the program, and are assessed for the year the farmer decides to withdraw along with the preceding four years. This sum is equal to the difference between the annual taxes on the fair market value of the parcel, and the amount actually paid during the five year period. In addition, the municipality usually holds the right of first refusal to all participating properties, giving it the option to purchase the parcel should the farmer choose to sell it for non-agricultural use.

Chapter 61B: Recreation Land Assessment Act

This program is applicable to recreational lands open to the public or to members of a club or organization. Under this Act, at least five acres of a qualifying parcel are assessed at fair market value, while the value of the remainder of the parcel is reduced by as much as seventy-five percent. The property is reassessed annually, and landowners are required to pay roll-back taxes if they choose to withdraw from the program or to change the use of their land.

Each of these differential property taxation programs help make it economically feasible for landowners to keep their property in forestry, agricultural, or recreational uses. While such financial benefits definitely assist the owner, none of these programs provide longterm protection for the land itself. Although penalties are charged for withdrawal from these programs, they generally aren't enough to deter conversion or sale of the land where market values far exceed forest or agricultural use values. Another disadvantage of these types of programs is that the reduction in value which benefits the owner translates into a loss in taxes for the municipality. While some of this can be recouped through the penalties charged for withdrawal from the programs, many communities are hesitant to encourage local participation in use-value taxation programs. On the other hand, while preferential taxation can lead to a gross loss in local tax revenues, it is essential to weigh these losses with the potential service costs a town may incur if these lands were developed.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN PROGRAM (ACEC)

The purpose of the Areas of Critical Environmental Concern (ACEC) program is to identify, preserve, restore, and enhance critical environmental resources throughout the Commonwealth. The ACEC Program was established in 1975 and is administered by the Department of Environmental Management. The program works through a public nomination, review, and designation process that can be initiated by a group of citizens, a municipal board or commission, a mayor or city council, a regional or state agency, or a state legislator. ACECs must include at least four resource categories, such as rare species habitat, wetlands, agricultural lands, or natural hazard areas, and have regional or statewide significance.

An ACEC designation is made by the Massachusetts Secretary of Environmental Affairs, and is intended to highlight the value and characteristics of the ACEC and to encourage sound resource stewardship. As a state designation, an ACEC directs state agencies to administer and review programs and projects under their jurisdiction to avoid or minimize adverse impacts on the resources of the ACEC. An ACEC designation complements local authority and zoning, and can help state, local, and private organizations work together to create an ecosystem-based framework for resource preservation and management. For additional information, contact the ACEC Program, 100 Cambridge Street, 14th floor, Boston, MA 02202; (617) 727-3160, ext. 552 or (413) 586-8706, ext. 21.

WETLANDS CONSERVANCY PROGRAM

Formerly the Wetlands Restriction Program, this program has been changed to reflect the recently adopted policy of "no net loss of wetlands." The goals are to map and register all the state's wetlands, and to place land-use limitations on them, allowing only those

activities which do not harm wetlands functions. The end product of the program is a permanent restriction which is recorded at the Registry of Deeds and which applies to the land regardless of changes in ownership. The statewide program is implemented on a town-bytown basis, and is expected to take another ten years to complete. For



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more information, contact the Wetlands Conservancy Program, Division of Wetlands and Waterways, Department of Environmental Protection, One Winter Street, Boston, MA 02108; (617) 292-5704.

MASSACHUSETTS ENDANGERED SPECIES ACT

After five years of effort by conservationists, the Massachusetts Endangered Species Act was signed into law in December 1990. The act has two main components. First, it prohibits the "taking" of any listed rare plants or animals (vertebrates and invertebrates) unless specifically permitted for scientific, educational, or propagation purposes. Penalties range from \$500 to \$10,000, plus up to 180 days in prison. Second, it pro-

tects designated "significant habitats." These can be designated for populations of endangered or threatened species after a public hearing. Once so classified, any alterations of significant habitat usually require a permit from the Department of Fisheries, Wildlife, and Environmental Law Enforcement. Penalties for the alteration of designated significant habitat without a permit range from \$1,000 to \$20,000, plus up to 180 days in prison. The violator may also be required to restore the habitat to its prior condition. For more information, contact the Natural Heritage and Endangered Species Program, Department of Fisheries, Wildlife and Environmental Law Enforcement, Route 135, North Drive, Westborough, MA 01581; (508) 366-4470, ext. 200.

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APPENDIX E

Voluntary Land and Resource Protection Techniques

Described below are some of the widely used voluntary land and resource protection techniques. Many of these options complement the state protection programs profiled in Appendix D, and it is often necessary to adapt or combine several regulatory and nonregulatory mechanisms to achieve your conservation goals. The actual combination of techniques used will depend on the land or resources being protected, and on the landowner(s) and/or organizations involved.

The information presented below provides only a broad overview and binding decisions should not be made without first seeking financial and/or legal advice. State and local governments and nonprofit conservation groups are also good sources of information and guidance.

PROTECTION THROUGH TRANSFER OF TITLE

There are numerous ways to transfer a piece of property from one owner to another. These range from giving it away to selling it at full market value. This section discusses the spectrum of available options and explores the consequences on the landowner, the organization acquiring the land, and the property itself.

DONATION

In the context of land protection, donation is the giving of property to a qualified nonprofit or governmental organization. It is the simplest mechanism to transfer land because financing and negotiations about cost are not involved. All that is required is a willing donor and qualified entity to receive the gift. The recipient may incur some indirect expenses including title examination, surveying costs, and inspection fees, but compared to the purchase price, these costs are usually

nominal. Donation as a land protection option relies upon landowners who believe that the benefits of protecting their property outweigh the costs of giving it away. If a piece of property is very special to an individual or family, knowing that it will be protected in perpetuity can be worth more than its dollar value.

In addition to personal satisfaction, a land donor may be able to take advantage of tax benefits which can help offset some of the financial loss associated with donating land. Under current federal tax laws, a donor can claim an income tax deduction for the fair market value of the land, provided it was donated to an organization with nonprofit status. Because the amount that can be deducted in a given year is limited, owners of very valuable property may wish to donate their property in installments, enabling them to deduct the maximum value permitted by law over a number of years. Donating property can also lower the value of a donor's estate, thus reducing the amount of estate taxes that will eventually be owed. An attorney or an accountant familiar with tax law should be consulted to determine the most beneficial way to proceed.

Land is a precious resource and donating it is a big decision. It is important for individuals to carefully consider whether they want to donate their land and to which organization to make the gift. Similarly, the recipient must carefully review proposed gifts of land in terms of its acquisition goals, its ability to effectively maintain and protect the land in the future, and the property's management needs and associated costs. While it is very tempting for land protection organizations to accept "free" acreage, most realize that they need to enforce some sort of quality control in terms of the conservation and recreational value of the land being gifted. They must also consider the organizational resources that will be required to manage the land for the uses intended in determining if the property is "worth" holding.

If both parties agree to the transfer, there are several available donor options.

Outright Donation

An outright donation is a transfer of title through which a landowner gives his or her property and all of the rights associated with it to a landholding organization. After this transfer, the former owner has the same rights to the land as any other citizen within the community.

Donation by Devise

Donation by devise is simply a donation of land given at the time of death, as stipulated in the landowner's will. With this option, the owner retains full use and control of the property until his or her death. This kind of gift reduces the value of the owner's estate and thus the amount of estate taxes due at the time of death. It does not, however, provide the kind of income tax savings available through charitable donations given during one's lifetime. In addition, even after the terms of the donation are stated in the will, the property owner is responsible for property taxes for the remainder of his or her life. One drawback of this method is that the named recipient may not wish to accept the gift at the time of the landowner's death. To avoid this situation, the landowner may enter into a contractual agreement with the recipient stating that the property will be donated by devise, name a second recipient, or donate the property with a reserved life estate.

Donation with Reserved Life Estate

This type of donation enables a landowner to donate land while retaining the right to use all or part of it during his or her lifetime, or during the lifetimes of other stated individuals. This type of arrangement is set forth in the deed which is turned over to the recipient at the time of donation. By doing this, the landowner may continue to enjoy his or her land, confident that it will end up in the hands of the chosen recipient. Typically, the original owner is responsible for property taxes as long as he or she continues to use the land for personal purposes. The effect this type of donation has on estate and income taxes depends upon the nature and extent of use during the donor's lifetime and upon the stipulations for future use by others after the donor's death. Again, an accountant or attorney should be contacted for details on specific situations.

SALE

By definition, the sale of a piece of property entails the transfer of ownership from one party to another for a price. For the most part, people and corporations buy and sell real estate for business purposes; the seller, wishing to make a profit, attempts to get the best price for each parcel sold. In the context of land conserva-

tion, factors other than, or in addition to profit may prompt the sale and purchase of land. Conserving open space, providing recreational opportunities, protecting critical resources and habitat areas, or preserving a treasured view are among the many reasons some landowners choose to sell their properties to public and private nonprofit conservation organizations. In general, if property is purchased by a land protection organization or agency, it will be permanently protected from development and used for purposes set forth in the statutes or mission statement governing that particular group.

Just as motivations for buying and selling land may vary, there is also a spectrum of mechanisms through which these transfers may occur. Each option provides the buyer and seller with different benefits and compensations. The goals, philosophies, and financial situations of all parties involved, not to mention the nature of the land itself, will help determine the most appropriate mechanism for a given situation.

Sale at Full Market Value

The purchase of a piece of property at full market value is the most traditional type of sale. In this kind of transfer, the price of the property is set by determining its value if it were utilized to the maximum extent allowable. This amount is tempered by market forces and the going prices of comparable properties.

Under certain circumstances, the fair market value of a piece of property may not be very high, enabling a nonprofit organization to pay full price without exhausting its budget. This is often true for land that cannot be used for much besides conservation or recreation, as is the case with wetlands or land that floods seasonally. The fair market value of these areas is based on their use as open space or conservation land, and is therefore much lower than that of parcels with development potential.

It is important to remember that a party selling their land at fair market value, regardless of their interest in protecting it, generally wishes to make a profit. If the land has appreciated over time, however, the increase in value is considered a capital gain and the seller is responsible for taxes on this amount. The actual amount of money owed depends on the extent to which the property appreciates and the capital gains tax rate at the time of sale. If the taxes owed have a significant impact on the net profit of the sale, the landowner may be willing to negotiate the price.

Bargain Sale

A bargain sale is the sale of a piece of property for less than its fair market value. If the property is sold to a qualified nonprofit organization or a government agency, the difference between the fair market value and the bargain sale price may be considered a charitable donation, and therefore may be claimed as a federal income tax deduction by the seller/donor. This tax benefit can help compensate for the money forfeited by selling the land at a lower price. In addition, lowering the sale price reduces the profit and can sometimes decrease the amount of capital gains tax owed. As always, an attorney and/or accountant should be consulted to help determine the most beneficial approach for both parties.

Installment Sale

An installment sale is a creative alternative to an outright purchase which involves the purchase of a piece of property over time. A seller may convey the entire parcel at once, but agree to accept payment for the property in annual installments. This type of arrangement can be financially beneficial to both the buyer and seller. If the original landowner does not need a large sum of money up front, spreading the income or capital gains over a number of years may provide a tax advantage. For the purchasing agency, spreading the cost of the property over time can help make an otherwise impossible acquisition economically feasible. In addition, this type of flexibility can free up a sizable portion of a nonprofit's annual budget, enabling it to work simultaneously on other acquisitions. Over time, this could result in more land protected for the same amount of money.

Sale With Reserved Life Estate

Similar to donation with reserved life estate, a landowner may sell property to a nonprofit organization with reserved life estate. Under this arrangement the landowner and any specified heirs are entitled to full or partial use of the land during their lives. As with any sale, the landowner receives real income, and depending on the terms of the sale may also be entitled to certain tax benefits. Another advantage of a sale with reserved life estate is that the original owner is responsible for property taxes as long as he or she continues to use the land, thus keeping the parcel on the local tax roles.

PROTECTION WHILE MAINTAINING FULL OR PARTIAL OWNERSHIP

Landowners are often interested in protecting their property, but do not wish to sell it. The following land conservation techniques do not involve a transfer of title and enable a property owner to protect specific features of his or her land while maintaining full or partial ownership. The methods presented vary in the level and duration of protection provided, in their impacts on private property rights, and in the financial benefits derived.

CONSERVATION RESTRICTIONS AND EASEMENTS

Conservation restrictions (CRs) and easements are legally-binding agreements between a landowner and a qualified nonprofit organization or government agency which limit the future use of a piece of property. CRs and easements are based on the notion that property ownership is comprised of several rights, each of which may be severed from the land and sold or donated to another party. In granting a restriction or easement, a landowner is choosing to convey some of his or her rights in the property to another party. This transfer of rights is recorded with the Registry of Deeds and becomes part of the title to the parcel(s) involved. Subsequent owners of the property are bound by law to the restrictions enumerated in the original document.

It is important to note that the terms conservation easement and conservation restriction are often used interchangeably. Both represent the transfer of specified rights from a landowner to a nonprofit organization or government agency. What differentiates these terms is the nature of the rights granted and the impacts these transfers have on the future use of the property. A conservation easement usually involves a positive granting of rights, enabling the grantee to do something on private land that would ordinarily be prohibited. For example, a public access easement gives citizens the right to traverse private property in specified locations. Similarly, a utility easement grants a utility company the right to erect and maintain service lines on private property. A conservation restriction may be characterized by a forfeiture of rights. In general, the rights to develop or to significantly change the land in some way are relinquished, limiting the kinds of activities permitted on the parcel subject to the restriction.

For example, in granting an Agricultural Preservation Restriction, a landowner is selling or giving away the right to develop his or her land. Similarly, an historic preservation restriction represents the sale or donation of the landowner's right to alter or change historical attributes of a structure or landscape. While the differences between CRs and easements may seem minor, it is important to understand the implications of the terms prior to approaching a landowner to discuss available land protection options.

In Massachusetts, the term "conservation restriction" is used more often than easement to describe the conveyance of certain property rights from one party to another for land and resource conservation purposes. For clarity's sake, this term will be used in the remainder of this section. It is important to remember, however, that the terms are often used interchangeably and some landowners may respond better to the word easement.

Conservation restrictions are quite versatile and can be used to protect the integrity of a variety of resources, including sensitive natural areas, scenic vistas, prime agricultural soils, forest resources, water sources, or most commonly, a combination of these important attributes. They are very flexible and can be tailored to fit the unique characteristics of a particular parcel and to satisfy the needs of various landowners. The actual CR document details the nature of the rights being conveyed and specifies the activities that will be prohibited in the future. The landowner maintains the title to the property and all the rights not expressly conveyed. In addition, it is assumed that any uses not specifically prohibited are permitted by current and future owners. Because conservation restrictions are legally binding and are usually granted in perpetuity, it is essential to get legal assistance in drafting and executing a CR. In addition, to take advantage of the full force of a conservation restriction, it must be submitted to the Massachusetts Secretary of Environmental Affairs for approval, unless the recipient is a state agency.

The value of a conservation restriction depends on the nature of the property rights being transferred and must be determined by an appraiser. Once the CR is granted, the value of the rights relinquished is subtracted from the value of the original parcel, thus reducing the fair market value of the land retained by the grantor. While this is true, landowners often sell CRs and are thus compensated for the reduction in value. Conservation restrictions may be donated or sold at a bargain price. Because these rights are being relinquished in perpetuity, donating a conservation restriction to a qualified donee constitutes a charitable contribution and in most cases may be claimed as a federal tax deduction. It is essential to consult a tax attorney and/or an accountant to determine when and if tax benefits apply.

One of the major factors influencing the success of conservation restrictions is the ability of the non-profit to enforce the restrictions. It is important to make sure that the entity to whom the restriction is granted is a stable organization and that it has the resources and expertise to effectively monitor the land and enforce the restrictions. Sometimes a second grantee is designated to ensure the continued protec-

tion of the property in the event that the initial recipient ceases to exist.

The most distinctive aspect of protecting land through conservation restrictions is that the land remains in private ownership, enabling a landowner to continue to own and use his or her property, while ensuring its protection in perpetuity. In addition, land subject to CRs remains on the local tax roles, making the technique more palatable to municipalities. For conservation organizations, purchasing and holding conservation restrictions is less expensive in terms of the purchase price and management costs, and is often more desirable than owning the full fee interest.

LONG TERM LEASE

A landowner wishing to protect his or her property while maintaining ownership may also lease it to a conservation organization. This type of lease grants full and usually exclusive use of the land to the nonprofit for a specified period of time. The landowner may charge rent or donate the use of his or her property. However, this type of donation is not considered a charitable contribution because it is limited in duration.

It is assumed that the landowner will recoup his or her "losses" should the decision be made to develop or sell the property in the future. The landowner is also permitted to place certain restrictions on the land for the term of the lease, and may specify how he or she plans to enforce them. One common method is simply to terminate the lease if the lessee fails to abide by the agreed upon restrictions. All the details of the agreement should be written into the lease and reviewed by an attorney and/or tax accountant.

Long-term leasing can provide financial benefits to the landowner if he or she chooses to charge rent. While leasing doesn't offer permanent protection, it does conserve the land for a period of time without requiring the owner to forfeit his or her right to sell or develop the property in the future. In addition, sound use and management by the lessee may persuade the landowner to consider a more permanent protection agreement for all or a part of the parcel in the future.

ADDITIONAL LAND PROTECTION MECHANISMS

LIMITED DEVELOPMENT

Limited development is a land protection method in which a small portion of a parcel is developed, while leaving a larger portion protected and undeveloped. Proceeds from the development of the smaller portion finance the purchase and protection of the remainder of the property. Development that does occur can be guided to preserve the most important natural features of the land. This technique works best when there is a portion of land that can be developed without adversely impacting the more sensitive areas needing protection.

Limited development became popular in the 1960s when escalating land values made acquiring entire parcels prohibitively expensive. Very often developing a portion of a parcel is the only way a conservation-oriented landowner or a land protection organization can afford to protect the remainder of the property. In addition, limited development is often viewed as a compromise between development and conservation.

LAND BANKING

Land banking is a mechanism through which money is raised and earmarked specifically for local land protection and acquisition. In general, land banks are operated by state or local governments and are funded through real estate transfer taxes or in some cases through local fee systems. All such revenue-generating approaches MUST be authorized by the state legislature.

Real estate transfer taxes, like any other tax, can be somewhat controversial. However, this type of tax is often more justifiable than others since the causal connection between growth and the need to acquire and protect open space is quite clear. Real estate transfer tax rates generally range between one-half to two percent. When property is purchased, the buyer is required to pay the land bank a percentage of the purchase price before recording his or her property deed. In an active real estate market and in areas where land values are high, this mechanism can generate a significant amount of money. Some transactions may be exempt from this transfer tax however, such as foreclosures, certain transfers to governmental or nonprofit groups, and a set minimum for first-time home buyers. Nantucket has had an active land banking program since 1984 and it has been a powerful force in preserving a number of important parcels of land including ponds, moors, and beachfront properties.

Acquisition by a NonProfit/ Conveyance to a Public Agency

One of the major advantages of a private nonprofit organization is its ability to respond quickly to conservation needs and to the fast pace of the real estate market. These organizations are not confined by time-consuming governmental procedures and can use available funds quickly. Although usually working with limited budgets, private landholding organizations have the flexibility to enter into all types of negotiations and can spend their funds more freely than governmental agencies. For these and other reasons, it is mutually beneficial for nonprofits and government agencies to work cooperatively to achieve common land protection goals.

Acquisition by a nonprofit and the subsequent conveyance to a public agency exemplifies this type of partnership. A land protection organization can acquire property on an interim basis and hold it until a government agency is able to purchase it from them. This protects threatened areas in a timely fashion and helps implement governmental programs. When the land is transferred to the agency, so are the management responsibilities and costs, thus freeing up the time and funds of the nonprofit to work on other land protection projects. Through this type of cooperation, land is permanently protected and the goals of both organizations are advanced. In order for this mechanism to work as intended, it is essential for the conservation organization to find a public agency willing and able to purchase the land back within a reasonable period of time.

BUY/LEASEBACK

This technique involves the purchase of a piece of property by a nonprofit organization and the subsequent lease of all or part of that parcel. Unlike many



land protection techniques, buy/leaseback arrangements can achieve conservation goals and address social needs simultaneously. In general, a local land trust acquires property and then rents it at use value to individuals who agree to use it in an environmentally-sound fashion. This could for example, enable farmers to utilize land that would otherwise be unaffordable, or in some cases provide housing opportunities for low- and moderate-income families. The land

trust also benefits because leasing generates income which can be used for the management and maintenance of the property.

Changes in use and alteration to the property are governed by the land trust, although several types of situations can be negotiated. Because of this flexibility, the terms of the agreement and the responsibilities of both parties involved must be carefully specified in the lease.

APPENDIX F Land Trusts

For information about land trusts, contact the Massachusetts Land Trust Coalition (c/o The Trustees of Reservations, 572 Essex Street. Beverly, MA 01915; (978-921-1944) or the Land Trust Alliance (1319 F Street NW, Suite 501, Washington, D.C. 20004-1106; (202-638-4725).

Acton Conservation Trust Richmond Miller, President/Treasurer P.O. Box 658 Acton, MA 01720 (978) 440-2396

Andover Village Improvement Society Nathaniel Smith, President P.O. Box 5097 Andover, MA 01810 (978) 475-1209

Attleboro Land Trust P.O. Box 453 Attleboro, MA 02703-0004 (508) 222-6164

Barnstable Land Trust, Inc. Jaci Barton, Executive Director Box 224 Cotuit, MA 02635 (508) 771-2585

Becket Land Trust Kenneth A. Smith, President P.O. Box 337 Becket, MA 01223 (413) 243-1765

Berkshire County Land Trust and Conservation Fund George Wislocki, Executive Director 20 Bank Row, Room 203 Pittsfield, MA 01210 (413) 499-0596

Blackstone River Watershed Association Margaret Lavalee, President c/o Northbridge Town Hall Whitinsville, MA 01588 (508) 752-3444

Bolton Conservation Trust Nancy W. Reed, Director P.O. Box 14 Bolton, MA 01740 (978) 779-5345

Boston Citywide Land Trust 8 Allegheny Street Roxbury, MA 02120

Boston Greenspace Alliance Richard Heath, Executive Director 44 Bromfield Street, #207 Boston, MA 02108 (617) 426-7980

Boston Natural Areas Fund, Inc. Valerie Burns 294 Washington Street, #301 Boston, MA 02108-4608 (617) 542-7696

Boston Urban Gardeners, Inc. Patricia King, Executive Director 46 Chestnut Avenue Jamaica Plain, MA 02130 (617) 522-1259

Bourne Conservation Trust Stephen Ballentine, President Box 203 Cataumet, MA 02534 (508) 563-2800

Boxford Open Land Trust Nancy Merrill, President P.O. Box 95 Boxford, MA 01921 (978) 887-2194

Brewster Conservation Trust Roger V. O'Day, President P.O. Box 268 Brewster, MA 02631 (508) 896-5691

Broad Brook Coalition Mary Anna McKim, President P.O. Box 60566 Florence, MA 01060 (413) 586-7069

Brookline Conservation Land Trust John Boit 50 Congress Street, Room 540 Boston, MA 02109-4002

Carlisle Conservation Foundation Majorie Getchell, President P.O. Box 300 Carlisle, MA 01741 (978) 369-3798

Carlisle Land Trust Ed Heald, President P.O. Box 300 Carlisle, MA 01741 (978) 369-3798

Central Roxbury Community Land Trust Lloyd A. Harding, President 81 Mount Pleasant Avenue Roxbury, MA 02119 (617) 442-2523

Chatham Conservation Foundation William F. Schweizer, President 104 Crowell Road Chatham, MA 02633 (508) 945-4084

Chelmsford Land Conservation Trust June S. Cook, President 22 Bentley Lane Chelmsford, MA 01824 (978) 256-7301

Cohasset Conservation Trust John Hubbard, Chairman P.O. Box 314 Cohasset, MA 02025 (781) 383-9394 Community Land Trust in the Southern Berkshires Susan Witt, Administrator P.O. Box 276, 195 Main Street Great Barrington, MA 01230 (413) 528-1737

Compact of Cape Cod Conservation Trusts, Inc. Mark H. Robinson, Executive Director P.O. Box 7, 3179 Main Street Barnstable, MA 02630 (508) 362-9131

Concord Land Conservation Trust Marian Thornton, Chairman P.O. Box 141 Concord, MA 01742 (978) 369-7205

Dartmouth Natural Resources Trust Stephen Sloan, General Administrator Box P-17 South Dartmouth, MA 02748 (508) 991-2289

Dedham Land Trust Polly Pierce 354 Westfield Street Dedham, MA 02026 (781) 329-1390

Deerfield Land Trust Mark Zenick P.O. Box 368 Deerfield, MA 01342 (413) 628-4696

Dennis Conservation Trust Edward Gelsthorpe, President P.O. Box 67 East Dennis, MA 02641 (508) 385-5590

Dover Land Conservation Trust David W. Lewis, Jr. P.O. Box 562 Dover, MA 02030

Dudley Land Trust Chester T. Kulisa, President Marsh Road Dudley, MA 01570 (508) 943-6520 Duxbury Rural and Historical Society David Wood Stookey Box 2772 Duxbury, MA 02331-2772

Eastham Conservation Foundation Henry Lind, President P.O. Box 183 Eastham, MA 02642 (508) 255-5716

Egremont Environmental Action and Land Trust Linda Benson P.O. Box 631 South Egremont, MA 01258

Essex County Greenbelt Association Edward O. Becker, Executive Director 82 Eastern Avenue Essex, MA 01929 (978) 768-7241

Fairhaven Land Preservation Trust 122 Pleasant Street Fairhaven, MA 02719 (508) 993-2404

Franklin Land Trust
Mark Zenick, Executive Director
P.O. Box 216
Ashfield, MA 01330
(413) 628-4696

Friends of the Boston Harbor Islands P.O. Box 9025 Boston, MA 02114 (617) 523-8386 or (617) 740-4290

Friends of Rattlesnake Gutter Trust Annette N. Gibawic, Secretary Rattlesnake Gutter Road Leverett, MA 01054 (413) 548-9082

Grafton Forest and Land Conservation Trust P.O. Box 114 Grafton, MA 01519

Great Barrington Land Conservancy Rachel Fletcher 195 Main Street Great Barington, MA 01230 (413) 528-3391 Greater Worcester Land Trust Allen Fletcher, President P.O. Box 1328 Worcester, MA 01601 (508) 755-8899

Groton Conservation Trust June Adams Johnson, President P.O. Box 395 Groton, MA 01450 (978) 448-3131

Hamilton-Wenham Open Land Trust Dana L. Hansen, Clerk/Treasurer 74 Blueberry Lane South Hamilton, MA 01982 (978) 468-2387

Hampden Land Project Sherry Himmelstein P.O. Box 455 Hampden, MA 01036 (413) 782-3183

Hancock Rural Land Foundation Beverly Stein P.O. Box 133 Hancock, MA 01237 (413) 738-5431

Hardwick Area Conservation Trust Lucinda Childs P.O. Box 5 Hardwick, MA 01037

Harvard Conservation Trust Pamela Durrant, President P.O. Box 31 Harvard, MA 01451 (978) 456-3695

Harwich Conservation Trust Robert Smith, President 466 Main Street Dennisport, MA 02639

Hilltown Land Trust
Wilmot R. Hastings, President
P.O. Box 259
Chesterfield, MA 01012
(413) 238-4411

Hingham Land Conservation Trust Katherine Morrison, Chairman 225 Hersey Street Hingham, MA 02043-3130 (781) 749-4023 Historic Deerfield, Inc.
Donald Friary, Executive Director
Box 321
Deerfield, MA 01342
(413) 774-5581

Hopkinton Area Land Trust, Inc. Mary Pratt, Secretary/Clerk P.O. Box 171 Woodville, MA 01784 (508) 435-4147

Housatonic Valley Association Lynn Werner, Executive Director P.O. Box 28 Cornwall Bridge, CT 06754 (203) 672-6678

Isle Au Haut Land Conservation Trust Frederick Eustis, Trustee P.O. Box 1422 Boston, MA 02104

The Kestrel Trust Judith Eiseman, President P.O. Box 1016 Amherst, MA 01002 (413) 253-2932

Land Preservation Society of Norton Suzanne Erikson, President P.O. Box 204 Norton, MA 02766 (508) 285-3534

Laurel Hill Association Norma Ogden, President Shamrock Street Stockbridge, MA 01262 (413) 298-3644

Lincoln Land Conservation Trust William G. Constable, Chairman P.O. Box 22 Lincoln, MA 01773 (781) 259-0199

Littleton Conservation Trust Doreen Morse, President 11 Nagog Hill Road Littleton, MA 01460 (978) 486-8292 Lowell Parks and Conservation Trust Gerry Gilday, Executive Director P.O. Box 7162 Lowell, MA 01852 (978) 934-0030

Lower Roxbury Coalition for Community Land Trusts Helen Foreman One Warwick Street Roxbury, MA 02120 (617) 442-3296

Madaket Conservation Land Trust Matt Byrne, Trustee c/o 40 Starbuck Road Nantucket, MA 02554 (508) 228-2633

Mahaiwe Harvest Land Trust Charlotte Zanecchia 350 North Plain Road Housatonic, MA 01236 (413) 528-3253

Manchester Conservation Trust Helen D. Bethell, Executive Director P.O. Box 1486 Manchester, MA 01944 (978) 526-7692

Mary Barton Land Conservation Trust J.E. Dietzgen, Treasurer Box 790 Cotuit, MA 02635 (508) 428-2534

Mashpee Land Conservation Trust Richard L. Terry, President P.O. Box 560 Mashpee, MA 02649 (508) 477-6500

Massachusetts Audubon Society John Post, Land Protection Director South Great Road Lincoln, MA 01773 (781) 259-9500

Massachusetts Forestry Association Gregory Cox, Executive Director P.O. Box 1096 Belchertown, MA 01007-1096 (413) 323-7326 Mattapoisett Land Trust George B. Mock, President P.O. Box 31 Mattapoisett, MA 02739 (508) 758-4943

Meadowbrook Land Trust Box 128 Grafton, MA 01519

Mendon Land Trust Kevin Rudden P.O. Box 217 Mendon, MA 01756

Metacomet Land Trust Christie Anderberg, Executive Director P.O. Box 231 Franklin, MA 02038 (508) 528-5267

Milton Land Conservation Trust David Jeffries, Trustee 1268 Canton Avenue Milton, MA 02186 (617) 333-0178

Monterey Preservation Land Trust Andrea Dunlop P.O. Box 914 Monterey, MA 01245 (413) 528-6785

Mount Grace Land Conservation Trust Leigh Youngblood 137 North Main Street, R.R. #1 New Salem, MA 01355 (978) 544-7170

Nantucket Conservation Foundation James F. Lentowski P.O. Box 13 Nantucket, MA 02554 (508) 228-2884

Nantucket Land Council Lynn Zimmerman 4 North Water Street, P.O. Box 502 Nantucket, MA 02554 (508) 228-2818 Nashoba Conservation Trust, Inc. Caroline Simmons, Membership and Outreach Coordinator P.O. Box 188 Pepperell, MA 01463 (978) 433-9244

Natural Resources Trust Marcia Benes, President 56 Taunton Street Plainville, MA 02762

Natural Resources Trust of Easton Garry VanWart, Executive Director P.O. Box 188 North Easton, MA 02356 (508) 238-6049

Natural Resources Trust of Mansfield Leonard Flynn 102 Jewell Street Mansfield, MA 02048 (508) 339-4691

New England Forestry Foundation Keith Ross P.O. Box 1099 Groton, MA 01450-3099 (978) 448-8380

New England Small Farm Institute Kathryn Ruhf, Co-Director P.O. Box 937 Belchertown, MA 01007 (413) 323-4531

New England Wildflower Society David R. Longland, Director 180 Hemenway Road Framingham, MA 01701 (508) 877-7630

New Marlborough Land Preservation Trust, Inc. Rita Mathews, President P.O. Box 189 Southfield, MA 01259 (413) 229-7738

Newton Conservators P.O. Box 11 Newton Center, MA 02159 (617) 244-6495 Nissitissit River Land Trust George Keyes, President P.O. Box 589 Pepperell, MA 01463 (978) 433-5711

North County Land Trust Henri L. Sans, Jr. P.O. Box 463 Gardner, MA 01440 (978) 632-0011

Open Land Fund K.D. Gifford, President 85 Sparks Street Cambridge, MA 02138 (617) 451-2355

Orleans Conservation Trust Charles H. Thomsen, President Box 886 East Orleans, MA 02643 (508) 255-2658

Pascommuck Conservation Trust Ed Dwyer, President P.O. Box 806 Easthampton, MA 01027 (413) 527-2211

Princeton Land Trust Hustace H. Poor, Secretary P.O. Box 271 Princeton, MA 01541 (978) 464-5206

Provincetown Conservation Trust Joseph Notaro, President P.O. Box 307 Provincetown, MA 02657 (508) 487-2016

Rattlesnake Gutter Trust Annette Gibavic, Secretary P.O. Box 195 Leverett, MA 01054 (413) 548-9082

Reading Open Land Trust Benjamin Nichols, President 25 Avon Street Reading, MA 01867 (781) 944-2438 Rehoboth Land Trust Jonathan Knowles 117 Carpenter Street Rehoboth, MA 02769

Richmond Land Trust B. Carter White, President P.O. Box 21 Richmond, MA 01254 (413) 698-2687

Rural Land Foundation of Lincoln Kenneth Bergen, Chairman/Trustees Box 87 Lincoln Center, MA 01773 (781) 348-8241

Salem Land Conservation Trust Paul Willis, President 2 River Street Salem, MA 01970 (978) 744-4561

Sandwich Conservation Trust John Cullity, President Box 531 East Sandwich, MA 02537 (508) 888-3462

The 'Sconset Trust, Inc. George M. Buckingham, Executive Vice President P.O. Box 118 Siasconset, MA 02564 (508) 257-6610

Seekonk Land Conservation Trust Nancy Messinger, President P.O. Box 383 Seekonk, MA 02771 (508) 336-7642

Sharon Land Trust Alison Walsh 34 High Street Sharon, MA 02067 (781) 784-8373

Sheffield Land Trust Deborah Reich, President Box 940 Sheffield, MA 01257 (413) 229-2890 Sherborn Rural Land Foundation George Fiske, Trustee P.O. Box 190 Sherborn, MA 01170 (508) 655-5148

Sheriff's Meadow Foundation Richard Johnson, Executive Director Wakeman Center, RFD Box 319X Vineyard Haven, MA 02568 (508) 693-5207

Sippican Lands Trust Horace Kenney, President 589 Mill Street Marion, MA 02738 (508) 748-2809

South End/Lower Roxbury Open Space Land Trust John Feingold, Vice President P.O. Box 180923 Boston, MA 02118 (617) 749-8331

Southborough Open Land Foundation Ron McAdow, Executive Director P.O. Box 345 Southborough, MA 01772 (508) 481-6837

Squam Lakes Conservation Society Peter Richards, President 7 Freeman Place Duxbury, MA 02330 (781) 934-6876

Stockbridge Land Trust Judy Spencer, President P.O. Box 1063 Stockbridge, MA 01262 (413) 298-4742

Stow Land Trust Marian Scott, President 285 Red Acre Road Stow, MA 01775

Sudbury Valley Trustees
Stephen Johnson, Executive Director
2 Clocktower Place
Maynard, MA 01754
(978) 891-5500

Swallow Rise Land Trust Michael Idoine Star Route, Box 44 Wendell, MA 01379 (978) 544-2623

Swansea Land Trust Jeanne Wadleigh, President P.O. Box 572 Swansea, MA 02777 (508) 679-0799

The 300 Committee Christine Dolen, Executive Director 157 Locust Street Falmouth, MA 02540 (508) 540-0876

Thoreau Country Conservation Alliance Vidar Jorgenson 100 Barrett's Mill Road Concord, MA 01742

Truro Conservation Trust Ansel B. Chaplin, Secretary Box 327 North Truro, MA 02652 (508) 487-1190

Trust for Appalachian Trail Lands c/o Appalachian Trail Conference P.O. Box 807 Harpers Ferry, WV 25425 (304) 535-6331

The Trustees of Reservations Frederic Winthrop, Jr., Director 572 Essex Street Beverly, MA 01915 (978) 921-1944

Tyringham Land Trust Penelope Littell P.O. Box 281 Tyringham, MA 01264

Upper Charles Conservation Trust John Thomas, President P.O. Box 5823 Holliston, MA 01746 (508) 366-0560 Valley Community Land Trust Al Ladd P.O. Box 1552 Greenfield, MA 01302 (413) 624-3048

Valley Land Fund Terry Blunt P.O. Box 522 Hadley, MA 01035 (413) 247-5831

Vineyard Conservation Society Brendan O'Neill, Executive Director P.O. Box 2189 Vineyard Haven, MA 02568 (508) 693-9588

Vineyard Open Land Foundation Carol Magee, Administrator RFD 319X Vineyard Haven, MA 02568 (508) 693-3280

Wellesley Conservation Council Arthur Ensroth 9 Martin Road Wellesley, MA 02181 (781) 431-1577

Wellfleet Conservation Trust Robert Hankey, President P.O. Box 84 Wellfleet, MA 02667 (508) 349-3761

West Stockbridge Mountain Association William Gibson, Coordinator P.O. Box 17 West Stockbridge, MA 01266 (413) 232-4210

Westford Conservation Trust Marian Harman, President 10 Chamberlin Road Westford, MA 01886 Weston Forest and Trail Association J. Thomas Selldorff, President 14 Pollywog Lane Weston, MA 02193 (781) 899-6506

Weston Land Trust James N. Burnes c/o 140 Chestnut Street Weston, MA 02193

Westport Land Conservation Trust Benjamin Guy, Treasurer P.O. Box 262 Westport Point, MA 02791 (508) 636-8963

White Oak Land Conservation Society George Dresser, Treasurer P.O. Box 346 Holden, MA 01520 (508) 829-4894

Wildlands Trust of Southeastern Massachusetts Mark Primack, Executive Director P.O. Box 2282 Duxbury, MA 02331 (781) 934-9018

Williamstown Rural Lands Foundation Leslie Reed-Evans, Executive Director P.O. Box 221 Williamstown, MA 01267 (413) 458-2494

Yarmouth Conservation Trust Cliff Cosgrosve, President P.O. Box 376 Yarmouth Port, MA 02675 (508) 362-5865

APPENDIX G

Greenways and Trails Demonstration Grants and Coasta! Access Small Grants

Since 1993, the Department of Environmental Management has sponsored an annual Greenways and Trails Demonstration Grants Program, which provides grant awards of up to \$5,000, and as of 1999, \$10,000 for multi-town projects. This program was established to help municipalities and nonprofit organizations realize innovative greenway and trail projects in Massachusetts. Included below are brief descriptions of a sampling of projects funded under this program. For more detailed information on these and any other projects funded by this Program, please contact Jennifer Howard, DEM's Greenways Coordinator, at (413) 586-8706 ext. 18. In 1995, DEM also began funding the Coastal Access Small Grants program. Several of the projects that have received support under this program are profiled below. For additional information, contact Geordie Vining, DEM's Coastal Access Planner, at (617) 727-3160, ext. 528. Detailed information on both these grant programs can be found in Appendix I.

GREENWAYS AND TRAILS DEMONSTRATION GRANTS

The Town of Acton's Nashoba Brook Greenway Trail Improvement project created a continuous trail at the Nashoba Brook Conservation Area through construction of a boardwalk across wetlands, construction of a bridge across the Nashoba Brook, and the creation of an educational kiosk at the ruins of a 19th century mill, also on the brook. The new path allows access to four of Acton's conservation lands from the proposed Bruce Freeman Rail Trail and creates a protected route for the Bay Circuit hiking trail, which previously traversed private property in Acton. Grant funds were used to purchase materials needed to complete all three components of the project.

Alewife/Mystic River Advocates, worked to create the Mystic River Basin Trail, a water based loop trail that will educate users about the Mystic River and highlight the river's social and natural, and opportunities for stewardship. The trail will be integrated into the youth education of local organizations and schools and the public boat rental programs at the Boys and Girls Club boathouse on the Mystic. Being on the river is one of the best ways to learn about it and develop lasting responsible relationships; this project helped to provide that opportunity for urban residents.

The Andover Trails Committee/Bay Circuit Alliance helped to launch the Shawsheen River Greenway initiative in Andover. Once complete, this greenway will run from Bedford to the Shawsheenís confluence with the Merrimack River, and it will include a bike trail link to the Bay Circuit and Merrimack River Trails. The Andover Trails Committee sponsored an art and photo contest to increase public interest and awareness in the project. It also undertook land ownership mapping to identify access points and key parcels for protection.

The Berkshire Chapter of the Appalachian Mountain Club built a 200-foot raised wooden boardwalk on the Appalachian Trail (AT) as it approaches a new bridge crossing in Sheffield. The boardwalk is supported by Helio coil augurs, which is considered to be an environmentally sensitive and innovative approach. The raised boardwalk will enable hikers to cross a 200-foot floodplain, which is impassable during rainy conditions. This project will help to ensure the continuity of the AT in Sheffield, and allow for both day and long distance use of the area.

The Ashuwillticook River Trail Committee has been working for several years to develop a multi-use trail along the Hoosic River and an abandoned B&M Railroad line. The fifteen-mile-long trail will run from Pittsfield to Adams in the shadow of Mt. Greylock, the

state's highest peak. The Committee used its DEM grant to prepare a feasibility study and to put together promotional and educational materials

With the 200 hundred mile Bay Circuit Trail nearing completion a need has arisen for both comprehensive and detailed information to distribute to users. The Bay Circuit Alliance used grant funds to produce a four page map and guide booklet (map scale to be 1:50,000) for trail users. The booklet highlights the open space gems and historic sites adjacent to the trail and provide information on local trail networks.

The Bay State Trail Riders Association coordinated a project to rehabilitate a 1.9-mile-long section of the Southern New England Trunkline Trail in Uxbridge. Volunteers from the Trail Riders Association and local scout groups regraded the trail, removed stumps, improved the drainage, and installed access control gates at the West Street crossing.

The Berkshire Natural Resources Council requested support to create a trail leading to and through Stevens Glen. This model trail was designed to provide access to and interpret the natural features of this unique site, while protecting the delicate ecology of the Glen system. Grant moneys were also used to generate a trail plan, construction drawings, and cost estimates associated with creating the trail.

The goal of the Emerald Necklace Greenway project is to reconnect the pieces of this important historic Olmsted park. The Bicycle Coalition of Massachusetts, BikeBoston Chapter used grant funds to develop public awareness for the need to restore the Emerald Necklace as a greenway and to conduct an initial engineering analysis of the problems and opportunities along the route.

The Boston Natural Areas Fund used grant funds to support the Neponset River Greenway Youth Conservation Team, a summer jobs and environmental education program for youth from the Boston neighborhoods of Mattapan, Dorchester, and Hyde Park, through which the Neponset River flows. Three eight-person teams worked to clear vegetation and debris along the Neponset River and to install benches and signs. They also participated in educational programs and field trips dealing with river ecology, wastewater management, water quality testing, and related topics.

Steven Levy's fourth grade class at the Bowman School in Lexington produced a video documenting their award-winning project where the class studied the

planning, construction, and use of the Minuteman Commuter Bikeway. Results of their "On the Trail" project have been utilized by bicycle trail planning committees in adjacent towns.

The Rocky Marciano Trail is Brockton's new citywide network of walking, biking and hiking routes that celebrates Brockton's heritage through the telling of Rocky Marcianois story. The City of Brockton, used grant funds for: design and implementation of interpretive wayside exhibits and a creative trail-marking system; organization of the Rocky Marciano Trail Team, a new Brockton trail-building youth group; and the creation of a map/poster celebrating the opening of the Rocky Trail.

The Cape Cod Pathways project is an ongoing effort to develop a Cape-wide network of walking trails linking protected open space and visitor attractions. As proposed, Cape Cod Pathways will extend from Falmouth to Provincetown with connections to all fifteen Cape Cod towns. The Cape Cod Commission used DEM support to hire a summer intern to coordinate the annual Walking Weekend, to develop a brochure, and to produce trail markers and signs.

Using GIS, the Central Mass Regional Planning Commission (CMRPC) identified potential linkages between existing open spaces across municipal boundaries within their planning region. CMRPC then produced maps on a watershed basis to show these connections. Maps were distributed to local conservation commissions, watershed associations, trail coalitions, environmental organizations and public libraries. The information is also included on CMRPC's Web page.

The Coalition for Buzzards Bay, in partnership with the National Park Service, is spearheading an initiative to develop a regional greenway and walking trail spanning the upper Buzzards Bay watershed. Grant funds were used to conduct a series of greenway planning workshops in host communities to increase public awareness, cultivate support, and assist in planning of the Buzzards Bay Greenway, and for the production and distribution of printed material. When the 75 mile greenway is completed it will connect 11 municipalities and more than 25,000 acres of protected land.

The Dedham Land Trust is working toward the creation of a trail system along Mother Brook which will provide educational opportunities related to the water corridor and promote stewardship of this watershed. The Trust focused on one segment of the greenway and used its grant funds to hire a botanist, a surveyor, and a

civil engineer to delineate wetland boundaries and to prepare an existing conditions plan. In addition, two educational kiosks interpreting the natural and historic significance of the site were constructed.

In 1988, the Dudley Street Neighborhood Initiative (DSNI) became the first grassroots group in the country to gain the authority of eminent domain, giving area residents the right to decide how to develop thirty acres of vacant land in their neighborhood in Boston. The greenway supported a community youth project to link four major open spaces in the Dudley Street area, including the two community center sites that are part of DSNI's revitalization plan. The project united neighborhood youth with a professional landscape architect, just as earlier the two community centers were designed through a collaboration between young people and professional architects.

The Duxbury Open Space/Recreational Planning Committee undertook a project to improve and promote the 7-mile Duxbury section of the Bay Circuit Trail with the goal of making it more visible, accessible, and interesting. Grant funds were used to purchase and install trail markers and signs to identify areas of interest along the trail, complete essential bridgework, and produce a professionally designed map and guide of the trail. Duxbury intends to promote their project and encourage other Bay Circuit Trail communities to improve and extend their sections of the trail through news articles and press releases, public access television, and community events. The Town also plans to involve community youth in the trail work, and then utilize the trail as an outdoor classroom for local school children, promoting awareness of the trail's wildlife habitat, flora, geologic features, and historic sites.

The East Coast Greenway will be the nation's first long-distance, interurban, multi-user, nonmotorized transportation corridor. When complete, it will link cities, suburbs, and countryside from Maine to Florida by connecting locally-owned and locally-managed trails. With DEM support, the East Coast Greenway Alliance (ECGA) organized two public information workshops for the regions surrounding Foxborough and Attleboro in southeastern Massachusetts. The purpose of these workshops was to stimulate community-based activism for greenways in this part of the state, which is currently underrepresented in East Coast Greenway planning efforts.

The overall goal of the Argilla Road Trail Project is to design and construct a 4.2-mile trail within the public

right-of-way along Argilla Road. The Essex County
Trail Association utilized grant funds to hire a consultant to work with volunteers and provide additional expertise needed for the project plan and design. When complete, the trail will enhance safe access to Cranes
Beach and other unique natural, historical and recreational amenities by people of all ages and abilities. It will also connect other regional trail initiatives.

The Farmington River Watershed Association undertook an Adopt-A-Stream project in southwestern Massachusetts. It recruited local Adopt-A-Stream groups in the towns of Otis, Becket, Tolland, Sandisfield, and Granville, making them responsible for taking care of the piece of the Farmington River which runs through their community. The Association plans to begin work on a greenway once the towns are involved in the river's protection.

The Francis Parker Charter Essential School developed a Nashua River Education/Outreach Program to educate students about the Nashua River and greenways through discussions, presentations, canoe trips, field trips and field studies. This program engaged students in an integrated, hands-on learning experience that connected them with the river and with the community. Students were involved in self-directed research on various greenway related issues. They then served as teachers and guides for the community through public presentations and a student-led canoe trip. This project also established an ongoing educational program at the Parker School involving the Nashua River, and its greenways and trails.

The Franklin County Commission is working to develop a twenty-three-mile-long bikeway through the towns of Deerfield, Erving, Gill, Greenfield, Montague, and Northfield. The Franklin County Bikeway Committee, a citizen advisory board, selected as its top priority a four-mile section that runs from the Great Falls Discovery Center in Turners Falls to the Cheapside Bridge in Greenfield. The funded project consisted of parcel-level GIS mapping of this section to identify affected landowners, as well as research on existing and potential legal access points to the adjacent Connecticut, Millers and Deerfield Rivers.

The Friends of Freetown State Forest have initiated the Rattlesnake Valley Trail Project to create an historically-significant walking/hiking trail along Rattlesnake Brook, which emphasizes what the area must have looked like during the colonial settlement period. This project included trail planning and layout, historical

research, clean-up and sandblasting of the historic Assonet Ledge, and preparation of a trail brochure.

The Fund for Parks and Recreation in Boston prepared a brochure to develop public interest and support for an urban heritage greenway linking open spaces and historical landmarks in Boston's Roxbury neighborhood. The intended greenway will feature interpretive plaques designed cooperatively by an artist and public school students and will create incentives for new street tree plantings. Once the greenway is established, the brochure will be updated and made available at the Boston Common Visitors' Center, in public schools, and through historic and tourist venues.

The City of Gardner and the Town of Winchendon are working together to create a fourteen-mile-long recreation trail linking the two municipalities. DEM support was used to complete a preliminary master plan and map of the proposed trail. In addition, the grant funded the installation of an informational kiosk at the entrance to a completed segment of trail in Gardner.

Using primarily volunteer labor, The Great Barrington Land Conservancy's River Walk project has so far recruited the help of over 900 people. The goal of River Walk is to involve as many residents as possible in the reclamation and stewardship of the Housatonic River in Berkshire County. In Great Barrington, this "working" river is being transformed into a town park and greenway trail. Grant funds were applied towards trail construction, educational materials for volunteers, and a trail-wide system of signage.

The goal of this project is to create an eleven-mile-long trail linking the Freetown/Fall River State Forest in Fall River to the Acushnet Cedar Swamp State Reservation in New Bedford. The Greater Fall River Land Conservancy and the Dartmouth Natural Resources Trust used DEM grant funds to hire a consultant to complete a resource inventory and to prepare a plan and map for the proposed trail. Most of the trail will be located on protected public lands, with only some eight percent crossing private property.

The Town of Greenfield is working to expand the existing Rocky Mountain Trail System to Canada Hill and the Riverside Archaeological District overlooking the Connecticut River. The Town used the grant funds toward acquiring one property necessary to link the Rocky Mountain trail system to Canada Hill. These funds also enabled the Town to leverage funds for another critical parcel. The acquisition protects a portion of an important archaeological site and will pro-

vide trail use for hiking, mountain biking, and interpretation of natural and historic resources. In addition, extending the trail to Canada Hill will link an existing, well-used trail system to the proposed Franklin County Bikeway at Route 2.

The Town of Hamilton constructed the first wheel-chair-accessible trail in northeastern Massachusetts. The trail parallels the Ipswich River in DEM's Bradley Palmer State Park and connects with a wooden pedestrian bridge, allowing fishing access to the river.

Historic Deerfield, a National Historic Landmark, completed a wheelchair-accessible path connecting the village with the Deerfield River and the Channing Blake Meadow Walk. It also emphasized increased public understanding of the relationship between the social and cultural history of the village and its natural environment.

The Hoosic River Watershed Association, in cooperation with the Deerfield River Watershed Association, used grant to produce four hundred plastic trail markers for the proposed one-hundred-mile-long Mahican/Mohawk Trail. In addition to delineating existing trail segments, markers were presented to officials and residents along the route to build support for the greenway project. The planned trail will create a pedestrian link between the Connecticut River and the Hudson River, re-creating a historic Native American trail which played an important role in the settlement of northwestern Massachusetts.

The Housatonic Valley Association worked with the 20 towns within the Massachusetts portion of the Housatonic River Watershed to develop "The Housatonic River Greenway Report." The report provides information on the status of numerous greenway and trail efforts and opportunities, and encourages information sharing and coordination throughout the watershed. It also gives those in various stages of project planning or implementation a greater sense of being part of the emerging regional greenway, which encompasses the entire Housatonic River corridor. The Housatonic Valley Association distributed the report to communities and interested parties throughout the watershed.

Keep Lowell Beautiful is coordinating the establishment of a 1-2 mile Greenway demonstration project along the northern side of the Merrimack River. Grant funds were used to design and construct two river accessways and to support the youth members of Spindle City Corps. who did landscaping and maintenance

along the proposed greenway. The overall goals of the project were to promote the natural, cultural and recreational values of this neglected riverfront area by developing a realistic strategy for maintenance, improving pedestrian access to the river, promoting increased recreational use of the greenway, and increasing awareness youth and residents have about the river and its environment.

The Kestrel Trust used grant funds to develop a manual on regional trail maintenance and management for its nine member towns. The manual includes sections on how to organize, build, maintain, and publicize a multi-town trail system. In addition, funds were used to expand a multi-town trail maintenance crew to work on trails in the Trust's nine-town region. The manual and efforts of the trail crew emphasize cooperation among towns to create and manage regional greenway networks.

In coordination with the Jones River Watershed Association, the Kingston Conservation Commission formalized existing conservation and access easements and researched the possibility of additional easements to create the Jones River Wildlife Corridor and Pedestrian Access Trail. This public-private effort seeks to preserve the varied ecosystems of the Jones River in the face of increased water withdrawals, continued development, and the impacts of dams.

The Lowell Parks and Conservation Trust produced a video of rafting and kayaking on the Concord River's Class III and IV whitewater to stimulate landowners and others interested in establishing a Concord River Greenway. The video was used to help negotiate protection of priority parcels that were already underway through support of the Stevens Foundation and the Riverways Program.

The Martha's Vineyard Commission performed a vegetative reconnaissance of two large undeveloped parcels in Oak Bluffs. These parcels are the most likely location for a needed link in the Cross-Oak Bluffs Trail effort, but they are also undergoing development pressure. The reconnaissance allowed for resource-sensitive trail links.

The Mashpee Conservation Commission's Mashpee River Educational Outreach Project expanded the existing Green Tourism program created by the town in 1994, and provided an opportunity to educate local school children about the Mashpee River's natural history, its importance as a greenway corridor, and its rich

Native American history. The grant funds were used to develop an educational curriculum focused on the Mashpee River Corridor that consists of four lesson plans, a field lesson at the Mashpee River and a follow-up packet of materials for Mashpee Grade 2 teachers and their students. Educational signage at key locations along the Corridor for children and adults of all ages was also developed and installed.

The Massachusetts Audubon Society (MAS) used grant funds to conduct an appraisal and land planning study of a 65-acre parcel of land with over 2,000 feet of frontage along the Green River in the Town of Leyden. The Green River is one of the state's cleanest and most scenic rivers, is considered a "Class A" (high quality) stream with regard to water quality, and is a prime cold water fishery. The information generated with grant funds enabled MAS to secure this important piece of property as part of ongoing efforts to create a protected greenway along the Green River.

The Merrimack Valley Planning Commission used its Greenways and Trails Demonstration Grant to map all existing greenways, trails, and protected open space in a seven-town area in northeastern Massachusetts. It then overlaid parcel-based information on unprotected lands to prioritize potential greenway acquisitions. The Commission also worked with each community to incorporate these greenway linkages into its local plans.

The Metropolitan Area Planning Council conducted a mapping and resource assessment of the Middlesex Canal for the Middlesex Canal Commission which will enable them to better manage and protect this historic resource. MAPC developed a series of detailed GIS maps that display parcel level data developed from local assessor maps for canal maintenance, preservation, and land acquisition. The map series is contained in an 11" x 17" map book that will be critical to further National Historic Registry recognition of Canal segments, and can also be used for guided tours.

The Monoosnoc Brook Greenway Project addressed the need for hands-on, experiential outdoor learning programs for 2,500 school children in Leominster. The goal of the project was to develop an "Outdoor Classroom" along a section of Monoosnoc Brook, where a greenway trail was built by the community. DEM support was used to develop an activities packet for teachers, and to film and distribute an accompanying video. This video explains the use of the Outdoor Classroom program in schools and by other communities.

The proposed 20-mile Tully Trail links important wildlife and recreational areas including Tully Mountain, Tully Lake (and its campground), Jacobs Ridge, Royalston State Forest, Warwick State Forest and the Metacomet-Monadnock Trail. The Mount Grace Land Conservation Trust used grant funds to hire a coordinator to recruit volunteers and organize work days to establish sections of the Trail. The grant was also used to organize two Tully Trail "Rambles," to create a Tully Trail map/brochure and a publicity campaign to inaugurate the Trail and announce its availability and attractiveness to the public.

This grant supported the Mystic River Watershed Association's model summer program, The Mystic Experience, which offered educational and experiential opportunities for youth in five lower watershed communities. Working with youth from the Somerville Arts Council's Mural Project, this program provided educational activities twice a week throughout the summer. Program participants learned about local history, hydrology, and animal and plant habitats, as well as taking field trips to explore local natural resource areas. The project culminated with the creation of a fantastic 80 foot mural depicting the river as it passes through Somerville, which now hangs on the cement overpass of I-93 and reminds passers by that the river is alive and well.

Mystic Valley Development Commission held a design charrette to promote the involvement of the public-atlarge in the design of the Malden River Park. The charrette focused on key elements of the park including: a 1000 foot segment of the park that shows the relation of the greenway to the river, the location and design for the pedestrian bridge, trail connections to the Mystic River reservation, and the area of the park in Everett, just north of the GE site, which will connect the trail to neighborhoods in Everett, the Bike to the Sea path and to the wetlands in that area.

The Nashua River Watershed Association hosted a day-long conference for local land trusts and others involved in greenways within the Nashua Valley. The thrust of the conference was to provide workshops on issues directly related to land protection; to relate those issues to regional watershed issues, focusing on the interconnectedness and the need for cooperation to extend beyond town boundaries; and to explore the creation of a Nashua River Watershed Land Trust Alliance.

The Nature Conservancy created a prescribed burn educational trail at their Drumming Ground Preserve,

adjacent to Manuel F. Correllus State Forest on Marthaís Vineyard. The overall goal of this trail is to raise public awareness and understanding of the critical role that fire plays in sustaining some of the regionís rarest natural communities, such as the sandplain grasses, as well as demonstrate the benefits and practicality of prescribed burning. TNC worked in cooperation with State Forest staff to link this new trail with the State Forestís existing trail network that attracts 9,000 visitors a year.

The North and South Rivers Watershed Association, Inc. received support for mapping, surveying, and undertaking an ecological assessment of the former railroad right-of-way lining the banks of the Indian Head River. The group also compiled photographs and color copies of the historic images of Hanover landmarks for use on greenway signs. The Indian Head River Greenway will create a network of protected land along the river corridor between historic Hanover Four Corners and Rockland. It is also part of a larger effort to implement recommendations of the Division of Marine Fisheries Anadromous Fish Project, in which the health of the fishery serves as a barometer of the quality of rivers and tributaries.

The Norwell Pathways Study Committee is working to develop a system of trails throughout the community which will highlight and link together several community resources, including the North River, conservation areas, schools, and historic resources. With DEM support, the Committee conducted informational meetings aimed at consensus-building to further develop plans for the proposed system, and in particular a two-and-one-half-mile-long walking trail along the North River. The Committee also created a brochure to publicize and promote the results of the meetings, and hired an engineer to assess the technical issues and costs associated with creating the proposed trail.

The Pioneer Valley Planning Commission and the City of Holyoke are working to create a Holyoke Canalwalk. The proposed circuit will connect an extensive system of canals which are in walking distance of each other, several parks, downtown Holyoke, and the Connecticut River. This grant was applied towards the preliminary design of the Canalwalk route and was used to initiate talks with landowners and other interested groups in Holyoke. The design work was summarized as a map, and a brochure was produced.

The Rattlesnake Gutter Trust, working in cooperation with the AMC, relocated a small section of the M&M Trail and built a critical bridge crossing over Roaring

Brook. They also developed a trail system in the Roaring Brook Corridor connecting conservation areas, extending the trail system into Amherst, and creating a link between the Leverett and Shutesbury Elementary Schools. The group also held a Roaring Brook Corridor Clean-Up and developed materials for a forward-looking planning effort to protect and enhance the Corridor.

The Regional Environmental Council worked to extend the East Side Trail beyond the borders of Green Hill Park, across private property and toward Lake Quinsigamond, in the city of Worcester. Tasks included flagging and marking the trail route, clearing brush, painting blazes and creating a map for public use. The trail extension boarders Coal Mine Brook, a stream with historical significance which is currently undergoing restoration to its native trout fishery. Most of the work on the trail project was performed by at-risk youth and local neighborhood volunteers. Several hikes were led by the Council to acquaint the public with the new section of the trail.

Volunteers from Salem Sound 2000, the Marblehead Community Charter Public School and other Marblehead community organizations, worked to re-establish a trail on local conservation land, and construct a footbridge crossing the Babbling Brook to reconnect a severed portion of conservation land to the Steer Swamp Conservation Area. A section of bank where the bridge crosses the brook was revegetated to rehabilitate the degraded riparian corridor and to improve access, aesthetics and habitat. A large scale map was designed and distributed and a spring nature walk was organized to publicize the project and to educate the public about use and stewardship of public land.

The Sherborn Bay Circuit and Open Space Committee conducted an ecological assessment in preparation for adoption of zoning and subdivision controls to protect local greenways. These will provide habitat corridors for red fox and other wildlife species.

The Sheriff's Meadow Foundation used its Greenways and Trails Demonstration Grant to develop a land preservation plan. The focus of the plan was on providing wildlife habitat connections between the one-hundred-acre Cedar Tree Neck Sanctuary and existing or proposed open space in the Indian Hill and Lambert's Cove areas of Martha's Vineyard.

The purpose of the Town of Sterling / Wachusett Greenways project was to stimulate students' understanding and community commitment to developing the Mass

Central Rail Trail, a 32 mile multi-use historic trail, and to look more closely at the current and future uses of the old Mass Central Railroad and its ties to the Quinapoxet River, Wachusett Reservoir, mills and natural history. Wachusett Greenways developed and installed signs with student art and maps depicting the trail in four towns to attract users and increase awareness.

The Valley Land Fund created open space maps for the towns of Deerfield, Montague, Wendell, and Whately. This information will be used to guide future land acquisition and trail connections, and will allow for joint open space planning among these four towns and the nine Kestrel Trust towns already mapped.

Wachusett Greenways is a collaborative of five towns: Holden, Paxton, Princeton, Rutland, and Sterling. This grant funded a regional Student Congress to promote a better understanding of greenways and to explore the concept of a five-town trail network. The day-long seminar featured several mini-workshops put on by the students and by interpretive staff from the Massachusetts Audubon Society's Wachusett Meadow Wildlife Sanctuary. The Student Congress was held May 22, 1996, and included up to two hundred middle school students and teachers from several towns in the region.

The Town of Ware undertook a planning and research project with the goal of developing a recreational trail between the towns of Ware and Hardwick. The study included a resource and parcel inventory, an economic analysis, an environmental impact assessment, and preparation and printing of a final report. The proposed trail would provide public access to lands along the west bank of the Ware River. The main focus of the project was on a section of the former southern branch of the Boston and Maine Railroad, which follows the course of the Ware River from the Town of Barre through Hardwick and Ware to its southern terminus in Palmer. The potential for public acquisition of lands between the railbed and the river was also examined, with the goal of creating a corridor of protected land along the river.

The Town of West Tisbury funded legal and title search work to establish the public's right of passage along the town's five protected ancient ways. These old footpaths and wagon roads provide vehicle-free access to school for fifty island children, shortcuts between neighborhoods, and recreational trails with the potential to link the island's coasts. The long-term plan is to connect the ancient ways with an island-wide network of walking trails.

The Westfield River Watershed Association involved Westfield youth in the planning and construction of a section of the Westfield River Trail. The grant funded an educational outreach program resulting in a site analysis, interpretive trail signs, the production of an educational brochure, and trail construction. In addition, the Watershed Association, in partnership with the YMCA, initiated a pilot program for canoeing and kayaking trips on the river for youth, to give them a chance to experience the river first hand.

WGBY/Channel 57 produced five short (4-6 min.) videos focusing on the natural history of the Connecticut River watershed. The videos, which were supplemented with an inquiry-based curriculum guide for grades 6-12, aired during the regular programming schedule of WGBY/57 and were made available to area teachers and non-profit environmental organizations. This video/curriculum package not only teach viewers about basic natural science concepts and river ecology, but inspire their curiosity to explore nearby open spaces and appreciate the diversity of Massachusetts' wild lands.

The Wildlands Trust of Southeastern Massachusetts designed and developed presentation materials entitled "Conserving Land/Conserving the River" which will be used for outreach to riparian landowners, community members, and local officials. The materials focused on riparian land protection measures to help conserve the Taunton River Watershed and enable communities in the area to prepare for the impacts of future growth. Grant funds paid for research, compilation of baseline data including, topography, ecological and scenic factors, and for the creation of the outreach and presentation materials. This project was part of a larger effort by the Taunton River Stewardship Program to develop a carefully conceived river protection strategy for the Taunton River.

The Taconic Trails Council played a key role in coordinating protection efforts for the Taconic Crest Trail among a wide variety of groups and agencies with an interest in creating a greenway along the Taconic Ridge between New York and Massachusetts. While the Council has been inactive for a number of years, popularity and use of the Taconic Crest Trail has greatly increased, resulting in the need for better and more unified management. The Williamstown Rural Lands Foundation utilized grant funds to reconvene the Taconic Trails Council in order to develop a strategy for addressing issues of long-term greenway management.

Winchester Citizen's Greenway Initiative designed and produced a promotional brochure to generate awareness and educate the town about existing and potential greenways within Winchester. Grant funds were used for design, layout, printing and distribution of the brochure. The brochure contains a map of the existing and potential greenway corridors within the town, including the Mystic Lakes area, Horn Pond Brook, and the Aberjona River. The brochure will bring to life a greenway vision for Winchester and will help to inspire the support and involvement of Winchester's citizens.

COASTAL ACCESS SMALL GRANTS

The 300 Committee designed and constructed a trail system on the 67-acre Sea Farms property, located in the southeastern section of Falmouth. The trail network is several miles in total, and leads to the saltwater inlets known as Bourne's Pond and Israel's Cove. The Coastal Access Grant supported the production of a contour trail map by a landscape architect with community input; professional trail cutting; production of a trail map/brochure; production and installation of site signs and trail markers; and the purchase and installation of benches.

The Beverly Coastal Access Group, along with the Ward II and Royal Side Civic Associations, promoted public access to the Beverly shoreline through community education and enhancement of two coastal access points. The grant supported: 1) development of a mobile display illustrating historic public access and points of interest along the Beverly coastline; 2) land-scaping, in cooperation with the local Garden Club, and installation of a bench at the Abbott Street Public Way to the sea; and 3) installation of signs at the City's Obear Park.

The Beverly Ward II Civic Association enhanced Pleasant View Tidal Beach area, located on the Bass River estuary, by returning it to a clean, sandy condition. The erosion of a hillside and siltation through a seawall had made walking the tidal beach unpleasant. The Coastal Access Grant supported the purchase and installation of anti-erosion textile matting, and the excavation of silt, debris, and non-native vegetation covering the beach.

The Boston Harbor Association expanded its efforts to support the 43-mile Harborwalk along Bostonís waterfront. Building upon the site evaluations funded in 1997, TBHA identified priority parcels owned by public, nonprofit, and private entities and developed specific strategies for completing Harborwalk connections on these properties. In addition, TBHA worked with the City of Boston and property owners to improve Harborwalk signage for the public.

Broached School, which teaches pre-K through 8th grade in Manchester, developed an innovative interdisciplinary curriculum that highlights the natural and cultural history of seven coastal properties owned by the Trustees of Reservations on the North Shore. The School also organized a "Coastal Connections" summer camp for school-children, and offered a certified professional development teacher training course to introduce teachers and camp counselors to the properties and help them use the curriculum. The grant supported staff time for curriculum development, transportation, equipment, and materials for the teacher/camp counselor training programs, and scholarship support for students.

The Coalition for Buzzards Bay, in cooperation with the Buzzards Bay Project and the Compact of Cape Cod Conservation Trusts, facilitated the adoption of municipal policies encouraging the use of conservation restrictions in the coastal communities of Marion and Wareham. These policies have been adopted in 11 Cape Cod communities and two other Buzzards Bay communities. The Coastal Access Grant supported meetings with Boards of Selectmen, Boards of Assessors, and Conservation Commissions in order to discuss such issues as setting formulas for property tax reductions, with the highest reduction for properties allowing public access.

The Town of Cohasset hired a consultant to produce a plan that developed recommendations and strategies to establish cohesive connections among the public access opportunities in Cohasset Harbor. In addition, the plan addressed how best to link these access points and ways with Cohasset Village and the village revitalization program. A comprehensive directional signage plan was also be produced.

The Town of Danvers promoted public access, use and enjoyment of its waterfront by identifying and enhancing public access ways to the Danvers River estuary. Funded by a 1995 Coastal Access Small Grant, the Town researched the ownership of ten potential public access points. Based on the information gathered, the 1996 Coastal Access Grant supported additional legal research on five of the ways to the water, plus surveys,

signage, and benches at the Bradstreet Avenue and Mead Street landings.

The Town of Fairhaven developed a plan for the future use of the Little Bay Conservation Area for education and passive recreation purposes, a property purchased with the assistance of Division of Conservation Services Self-Help funds. A design competition was be held among graduate planning, landscape, architectural and design students, offering financial awards for the top design entries. The plans detailed environmentally appropriate public access, and recommended specific actions and improvements. In addition, a student intern was hired to conduct a follow-up inventory of plant and wildlife conditions. The grant supported the intern's stipend, design competition prizes, and supplies.

The Falmouth Bikeways Committee, Town of Falmouth is educating and informing visitors about the natural and cultural history of the Shining Sea Bikeway in Falmouth. The Coastal Access Grant supported the research, design, writing, and printing of an educational pamphlet and trail map, to be distributed through boxes on the trail and at other local sites.

The City of Gloucester enhanced the accessibility of Half Moon Beach and Cressy's Beach in Stage Fort Park by rehabilitating several sets of stairs from the bluff. The Coastal Access Grant supported the purchase of construction materials plus a portion of the necessary labor.

The Town of Manchester-by-the-Sea promoted bicycling as an alternative means of transportation to Singing Beach, Black Beach, White Beach, and Tuckís Point Beach. Automobile parking at these beaches is quite limited (and non-existent at White Beach), and restricts general public access to these beautiful coastal sites. The Town placed bicycle racks at these four beaches, and installed signage informing the public about access to the beach, location of bike racks, rules, and other information. A ibike to the beachi logo was designed by Montserrat College of Art students, and a subsequent public information campaign was initiated. The grant supported the purchase of the bicycle racks, plus fabrication and installation of the signs.

The Marshfield Beach Rights Coalition continued legal research aimed at identifying and preserving public access to Old Rexhame Beach in Marshfield. The residents of the area have posted warning signs, installed plantings to obscure the ways, blocked passage through fences and chains, hired security guards, and pressed

for criminal trespassing charges. The Marshfield Beach Rights Coalition reviewed every deed conveyed by Marshfield in this area during the past few hundred years in order to substantiate its claim that the Town has owned the beach since 1645, plus an access way to it. The grant supported staff time, legal services, and associated materials.

The Town of Provincetown has been developing a comprehensive harbor plan, and recognized that a unique opportunity existed to plan and improve public waterfront access by recommending DEP Chapter 91 license conditions, due to the many properties anticipated to need such licenses. The Coastal Access Grant supported student stipends to conduct a comprehensive assessment of properties requiring Chapter 91 licenses, determine existing and potential public access ways to the waterfront, and provide a strategy for waterfront access improvement.

The Town of Rockport repaired a portion of the coastal Old Garden Path that had been undercut by erosion. A primary route to Old Garden Beach, the path is handicapped accessible when fully maintained, and, within easy walking distance of the village center, is the most extensively used coastal pathway in town. A section of the path had been severely undermined by storminduced erosion, and lead to the closing of the path. The Coastal Access Grant partially supported the engineering services and construction necessary to stabilize the embankment through rip-rap and repair the damaged pathway.

The Sippican Lands Trust formalized and developed its Junior Stewards Program in Marion. College and high school students from the area were recruited to conduct water quality research, study indigenous flora and fauna, and monitor and map trust-owned coastal lands. The Junior Stewards then researched and produced a pamphlet guide describing three coastal properties. The Coastal Access Grant funded the stipends of the students involved.

The Town of Somerset continued its research for the development of a trail around the scenic and largely undeveloped Broad Cove tidal embayment. This work built upon the foundation of a previously-funded survey and topographic plan of the area. About 4 acres of

the 14.9 acre Broad Cove lies within the Town of Somerset. The Town commissioned a "biocensus" and wildlife habitat evaluation of the bay and salt marsh of Broad Cove, which will provide natural history information for future interpretive materials as well as guide the location of the proposed boardwalk. The grant supported the field study and trail route design by a wildlife biologist.

The Town of Truro utilized grant funds to provide universal access to the Townís Corn Hill Beach. Currently, none of the public beaches in town are accessible to those with mobility impairments. The Town purchased two Surf Chairs, a storage shed, and a "Beachrings" mat system to improve access on the sand. The grant supported purchase of the Surf Chairs, materials for the storage shed, and Beachrings.

The Trustees of Reservations Cape Ann Management Unit, utilized grant funds to establish a ferry service to TTOR's Misery Islands Reservation during the summer of 1997. With sweeping views from Gloucester to Marblehead, diverse topographical and vegetative features, and a colorful history, the 83.5 acre Great Misery Island and adjacent 5.5 acre Little Misery Island make up one of the Trustees' most dramatic properties. It has also been one of the hardest to get to by the public, as previously one had to have a private boat to access the islands. The grant supported the chartering of a boat to offer passenger service from Manchester Harbor throughout the summer. It is anticipated that this successful demonstration will lead to permanent ferry service to this beautiful coastal site.

The Town of Winthrop engaged the services of Naecker Ammondson Architects and their consultants Carol R. Johnson Landscape Architects, Inc. and A. M. Fogarty & Associates to establish a plan that identified the Town's public access ways to the shoreline, inventoried their condition, detailed their needs (e.g., paths, plantings, stairways, walls), and estimated construction costs. The condition and use of the public ways had deteriorated due to the pollution of Boston Harbor, but improved water quality is renewing interest in these resources. The grant supported the services of the consultant to conduct the survey, produce architectural drawings, and make recommendations.

APPENDIX H Sources of Interns

Listed below are potential sources of interns or research assistants. Where applicable, phone numbers are given for specific departments or programs; if no number is listed, contact the school's career placement office. Many local community colleges may also be able to provide interns. Call the career development office at the campus nearest you to explore this possibility.

Amherst College Box 2237, Station 2 Amherst, MA 01002 (413) 542-2000

Antioch/New England Graduate School Environmental Studies Department 40 Avon Street Keene, NH 03431 (603) 357-3122

Atlantic Center for the Environment 39 South Main Street Ispwich, MA 01938-2321 (978) 356-0038

Boston College 140 Commonwealth Avenue Chestnut Hill, MA 02167 (617) 552-8000

Boston University 881 Commonwealth Avenue Boston, MA 02215 (617) 353-2000

Brandeis University 415 South Street Waltham, MA 02254 (781) 736-2000

Clark University 950 Main Street Worcester, MA 01610 (508) 793-7711

Conway School of Landscape Design Delabarre Avenue Conway, MA 01341 (413) 369-4044

Environmental Intern Program Northeast 68 Harrison Avenue Boston, MA 02116

(617) 426-4738

Hampshire College 893 West Street Amherst, MA 01001 (413) 549-4600

Harvard Graduate School of Design Dept. of Landscape Architecture Harvard University Cambridge, MA 02138 (617) 495-4731

John F. Kennedy School of Government Harvard University 79 JFK Street Cambridge, MA 02138 (617) 495-1335

Massachusetts Association of Conservation Commissions, Inc. 10 Juniper Road Belmont, MA 02178 (617) 489-3930

Massachusetts Institute of Technology School of Architecture and Planning 77 Massachusetts Avenue Cambridge, MA 02139 (617) 253-2022

Mount Holyoke College South Hadley, MA 01075 (413) 538–2000

New England School of Law 154 Stuart Street Boston, MA 02116 (617) 728-7600

Northeastern University 360 Huntington Avenue Boston, MA 02115 (617)373–2000

Radcliffe Seminars Landscape Design Program 6 Ash Street Cambridge, MA 02138 (617) 495-8600

Smith College Northampton, MA 01060 (413) 584–2700

Tufts University
Department of Urban and Environmental Policy
97 Talbot Avenue
Medford, MA 02155
(781) 627-3394

University of Massachusetts/Amherst Department of Landscape Architecture and Regional Planning Hills North Amherst, MA 01003 (413) 545-2255 Campus Career Network (413) 545-2224 University of Massachusetts/Amherst Environmental Sciences Program 111 Stockbridge Hall Amherst, MA 01003 (413) 545–0111

University of Massachusetts/Boston University Advising Center McCormick Hall Boston, MA 02125 (617) 287–5000

University of Massachusetts/Boston Environmental Sciences Program Boston, MA 02125 (617) 929-8255

University of Massachusetts/Dartmouth Dartmouth, MA 02714 (508) 999–8000

University of Massachusetts/Lowell One University Avenue Lowell, MA 01854 (978) 934–4000

Williams College Center for Environmental Studies Kellogg House, Box 632 Williamstown, MA 01267 (413) 597–2346

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APPENDIX I

Grants for Greenway Planning and Land Protection

Listed below are a sample of state, federal, and nonprofit grant programs. When possible, funding levels and application deadlines are given, however, these are subject to change and should be verified with the particular funding source. For additional information and sources of support, we suggest you consult other greenway groups as well as Associated Grantmakers, a philanthropic resource center designed for use by individuals and nonprofit organizations (see listing in Appendix B).

STATE GOVERNMENT FUNDING SOURCES

Executive Office of Communities and Development, Division of Community Services, Bureau of Planning and Regionalism, 100 Cambridge Street, Boston, MA 02202; (617) 727-7001.

Strategic Planning Grant Program: The purpose of Strategic Planning Grants is to promote wise use of land and protection of resources. They target landuse and development planning needs in communities to help them anticipate and guide growth and change. There are three types of grants: Municipal, Regional, and Special Purpose. Municipal Grants provide funds for planning local land-use initiatives, while Regional Grants support interlocal planning projects and related educational programs. Special Project Grants help communities to identify local land use issues, to conduct growth management training programs, and to address sudden planning needs. Grants are available to municipalities, groups of municipalities, counties, and regional planning agencies. Applications are due each year in early July.

Executive Office of Environmental Affairs, Watershed Initiative, 100 Cambridge Street, Boston, MA 02202; (617) 727-9800, ext. 412.

Watershed Initiative: Comprehensive and Capacity Building Grants Program, EOEA administers these grants to help groups or partnerships develop organizational strength to accept responsibility for healthy watershed stewardship, develop broad public participation in designing a plan of action for the watershed, and coordinate with the Watershed Team for assessment and implementation of practices intended to improve natural resources through watershed improvements. Grants are available to watershed

organizations and regional planning agencies. Oneto-one matching cash funds are required (in-kind matches are not acceptable). Applications are due in the fall.

Executive Office of Environmental Affairs, Massachusetts Coastal Zone Management Office (MCZM), 100 Cambridge Street, Boston, MA 02202; (617) 727-9530.

Harbor Planning Program, (617) 727-9530, ext. 456: MCZM offers communities the opportunity to apply for matching funds to develop comprehensive plans that are consistent with the state's established guidelines. All funded plans must meet MCZM criteria for acceptance of plans, as defined in 301 CZM 22.08 (4). Any coastal city or town may apply.

Massachusetts Bay Grants Program, (617) 727-9530, ext. 406: This Program sponsors two types of grants: Bay Action Grants and Demonstration Grants. Bay Action Grants provide funds for small, local coastal awareness projects in schools, businesses, or municipal offices. Demonstration Grants support innovative approaches to managing local sources of pollution. Both grants are open to non-profit groups, citizens, business educators, and municipalities. Bay Action Grants typically range from \$100 to \$1,500 per project and applications are due by the end of March. Awards for Demonstration Grants run between \$15,000 and \$35,000 per project; applications are submitted in early summer.

Executive Office of Environmental Affairs, Department of Environmental Management, 100 Cambridge Street, Boston, MA 02202; (617) 727–3160.

Coastal Access Small Grants Program, (617) 727-3160, ext. 528: Through this program, nonprofits and municipalities may receive small grants (up to

\$5,000) for projects that improve or enhance the general public's access to the coast. The primary categories for funding are: 1) creating new coastal pathways; 2) enhancing or restoring existing coastal pathways; 3) reclaiming public access ways from encroachment and/or neglect; and 4) educating the public about coastal access through community outreach and organization building. Deadline for grant applications is in late fall. Grant awards made in early winter.

Greenways and Trails Demonstration Grants Program, (413) 586-8706, ext. 18: Annual small grants (up to \$5,000, or \$10,000 for multi-town projects) to communities and nonprofit organizations for innovative greenways and trails projects. Projects may involve greenway planning, research, maintenance, expansion, mapping, resource assessment, or education and community outreach. Priority given to projects that involve community youth and promote "environmental literacy," projects that highlight rivers and streams, and projects that will serve as models for other greenway and trail efforts in Massachusetts. The deadline for grant applications is in late fall. Grant awards are made in early winter.

Lakes and Ponds Grant Program, (617) 727-3267, ext. 524: This grant program focuses on cost-effective, comprehensive, and integrated approaches to lake and watershed management, protection, and restoration. The emphasis is on local creativity and self-help efforts, and on proposals which develop or enhance public access or use of a water body. Lakes and ponds grants are available on a 50/50 cost-sharing basis to municipalities, local commissions, or local authorities, with a maximum award of \$10,000 per project. Applications must be postmarked no later than December 15; awards are announced in March.

Massachusetts Historic Landscape Preservation Grant Program, (617) 727-3160 ext. 519: This program provides funding and technical assistance to support the preservation of municipally owned, historic landscapes listed or eligible for listing on the National Register of Historic Places. The program supports projects aimed at preserving and revitalizing municipally owned, historic landscapes including but not limited to: parks, residential grounds, estate grounds, town commons, commemorative grounds, cemeteries and burial grounds, grounds of public and civic buildings, parkways, drives and trails, agricultural landscapes, industrial grounds, and archaeological sites. Grants of up to \$50,000 per year per project are available on a reimbursement basis, and a municipal cash match is required. Activities eligible for

funding include inventory and planning, construction, preservation maintenance, public education and stewardship.

Massachusetts Forest Stewardship Program, (413) 256-1201: Funding through this program is intended to motivate landowners to protect and enhance forest values through planned management. For additional information, contact the Forest Stewardship Coordinator, 463 West Street, Amherst, MA 01002.

National Recreational Trails Act Funding Program (Symms Fund), (617) 727-3180, ext. 655: Federal TEA-21 funds are distributed by DEM through this grant program to nonprofit trail clubs and other organizations, municipalities, and state and regional agencies for the development and maintenance of trails and trail-related facilities and projects. Grants are available for nonmotorized, motorized, and "shared-use" trail projects. Other program guidelines may change from year to year. Contact the Program Coordinator for current information on funding levels and application deadlines.

Urban Forest Planning and Education Grants Program, (617) 727-3180, ext. 657: DEM's Urban Forestry Program offers these grants to build support for the protection and management of community trees and forests. The funds are used for organizational development assistance to existing or emerging volunteer tree groups organizing community projects such as workshops, tree inventories, and public awareness campaigns, with an emphasis on community participation. Municipalities, nonprofit organizations and local community volunteer groups are eligible to apply. Maximum award amount is \$10,000, with a one-to-one match from local funds or in-kind services required. Applications are due in the spring, and funding decisions are made in June. Projects must be completed from July 1 to June 30.

Mass ReLeaf Grants Program, (617) 727-3180, ext. 657: This program is funded by corporate and private donations to a state trust fund, and promotes partnerships between business, government, and nonprofit groups for tree planting projects. Grant awards up to \$5,000 are available to municipalities, nonprofit organizations, and local community tree volunteer groups specifically for the purchase of tree stock only. Grants do not cover labor costs. Matching cash or in-kind services are required. Applications are due around February, and funding decisions are made in April.

Executive Office of Environmental Affairs, Department of Fisheries, Wildlife and Environmental Law Enforcement, 100 Cambridge Street, Boston, MA 02202; (617) 727–1614.

Non-Game Tax Fund, (508) 792-7270, ext. 200: Massachusetts currently has a check-off box which allows individuals to donate to the Natural Heritage and Endangered Species Fund, a program which keeps track of endangered species and habitats throughout the United States. These funds help purchase habitat needed for endangered plant and animal species. Municipalities and nonprofit organizations are eligible to apply for grant monies from this fund.

Riverways Urban Rivers Small Grants Program, (617) 727-1614, ext. 360: Urban Rivers Small Grants are provided to cities and towns for projects that revitalize urban river corridors through the preservation or restoration of wildlife habitat or enhancement of lands along the rivers for recreation or aesthetic benefits. Awards range from \$5,000 to over \$10,000 on a reimbursement for services basis. Requests for proposals are issued in September, and applications are due in October or November. Award decisions are made in December. Nonprofit organizations can work in conjunction with cities and towns to carry out funded projects.

Executive Office of Environmental Affairs, Division of Conservation Services, 100 Cambridge Street, Boston, MA 02202; (617) 727-1552, ext. 292.

NOTE: To be eligible to participate in these three grant programs of the Division of Conservation Services, a municipality must submit, or have on file, an approved Open Space and Recreation Plan that has been developed or updated within the past five years. The deadline for applications is the first of June.

Self-Help Program: The Self-Help program assists municipal conservation commissions in acquiring land for conservation and passive outdoor recreation purposes. The intent is to preserve lands and waters in their natural state, especially areas containing natural, historical, or cultural features or extensive water resources. Any community with an established Conservation Commission and approved Open Space plan is eligible; towns must provide a ten to fifty percent match depending on the project.

Urban Self-Help Program: Urban Self-Help Grants are available to cities and towns for the acquisition of land and for the construction, restoration, or rehabilitation of land for park and outdoor recreation

purposes. Any city (or any town with over 35,000 year-round residents) which has an authorized park and/or recreation commission and a conservation commission may apply. Communities that do not meet these population criteria may be eligible under the "small town," regional, or statewide project provisions of the program. Municipalities must provide a ten to fifty percent match depending on the project.

Land and Water Conservation Fund: This federal reimbursement program is administered by the National Park Service for the acquisition, development, or renovation of park, recreation, and conservation areas. Projects must be consistent with the Commonwealth's State Comprehensive Outdoor Recreation Plan (SCORP). Funding is available to any public agency with an approved Open Space Plan and a handicap accessibility program. Recipients must provide a fifty percent match and there is a maximum award value of \$150,000 per grant.

Executive Office of Environmental Affairs, Massachusetts Environmental Trust, 33 Union Street, 4th Floor, Boston, MA 02108; (617) 727-0249.

General Grants: The Massachusetts Environmental Trust was established by the Legislature in 1988 and receives its funding through the settlement proceeds of environmental lawsuits, and through fines and penalties, and from the state's environmental license plates. Municipalities, state government, nonprofit groups and educational institutions are eligible to receive these grants of \$5,000 to \$20,000. Guidelines are mailed out in late summer/early fall. Call for more information.

Executive Office of Transportation and Construction (EOTC), Massachusetts Highway Department, Bureau of Transportation Planning and Development, 10 Park Plaza, Room 4150, Boston, MA 02116; (617) 973–7313.

Transportation Equity Act for the 21st Century (TEA-21): This program involves federal grant disbursements to local projects to reduce the negative impacts and improve the quality of existing transportation. Monies can be used to fund numerous surface transportation projects, including bicycle and pedestrian trails. Within the Surface Transportation Program there is a ten percent set-aside for "Enhancements." These include environmental remediation projects such as run-off control, as well as planning, research and development, restoration, rehabilitation, historic preservation and other special

projects. Municipal and other government agencies may sponsor projects under the Enhancement category; there is a ten percent local match requirement.

Office of the Secretary of State, Massachusetts Historical Commission (MHC), 30 Boylston Street, Boston, MA 02116; (617) 727-8470.

Massachusetts Preservation Projects Fund: This is a state-funded matching grant program which supports the preservation of properties, landscapes, and sites (cultural resources) listed on the State Register of Historic Places. Eligible projects include 1) predevelopment projects such as feasibility studies, historic structures reports, or certain archeological investigations; 2) development projects involving construction for stabilization, rehabilitation, restoration, or protection; and 3) acquisition projects to purchase State Register properties facing imminent threat of inappropriate alteration or destruction. Requests for pre-development projects range from \$5,000 to \$30,000; requests for development and acquisition projects run from \$7,500 to \$100,000. Municipalities and nonprofit organizations are eligible to apply. Pre-applications must be submitted by the first week of March; awards are made in mid-November.

Survey and Planning Program: This federally-funded program provides support to local historic commissions for surveying and planning of registered historic districts, buildings, and landscapes, including preservation planning activities and completing surveys of historic resources. Applications are available in fall for awards made the following spring.

FEDERAL GOVERNMENT FUNDING SOURCES

Environmental Protection Agency (EPA), Environmental Education Grants, U.S. EPA, Region 1, Environmental Education Grants, Grants Information and Management Section, JFK Federal Building, Boston, MA 02114; (617) 565-3404 or 565-9447.

The Environmental Education Grants program provides financial support for projects which design, demonstrate, or disseminate environmental education practices, methods, or techniques. This EPA program funds projects from schools, nonprofit organizations, and government educational or environmental agencies which 1) improve teaching skills; 2) build environmental education programs; 3) promote environmental education careers among students; 4) educate about human health problems due to pollution; and 5) pro-

mote environmentally-conscious and informed decision-making. Applicants may request up to \$250,000 for any one grant, but pre-applications which request support for \$5,000 or less have the best chance of being funded. Contact the EPA Regional Office for pre-application deadlines.

See also the listing for the Land and Water Conservation Fund under State Government Funding Sources, Executive Office of Environmental Affairs, Division of Conservation Services.

NONPROFIT ORGANIZATIONS

Fields Pond Foundation, Inc., 77 Rumford Avenue, Suite 3C, P.O. Box 667, Waltham, MA 02254-0667; (781) 899-9990.

The primary mission of the Fields Pond Foundation is to provide financial assistance to nature and land conservation organizations which are community-based, which address specific environmental challenges, and which serve to elevate environmental awareness by involving local inhabitants in conservation issues. To nurture such grassroots conservation efforts, the Foundation provides grants between \$500 and \$10,000 to nonprofit organizations based on the following priorities: 1) assistance in establishment of endowments, particularly to fund specific on-going programs; and 2) specific project grants for enhancement of public access to conservation lands, rivers, coastlines, and other natural resources, trail development, land acquisition and conservation, and related educational programs and publications. Applicants are encouraged to contact the Foundation to discuss their proposal plans prior to preparing a formal application. There is no set deadline for submittal and applications are reviewed monthly.

Kodak American Greenways Awards Program, The Conservation Fund, 1800 North Kent Street, Suite 1120, Arlington, VA 22209; (703) 525-6300.

A partnership project of Kodak, The Conservation Fund, and the National Geographic Society, this program provides small grants to stimulate the planning and design of greenways. Its goals are to foster new, action-oriented greenway projects, to assist grassroots greenway organizations, and to recognize and encourage greenway proponents and organizations. The awards are aimed primarily at local, regional, and statewide nonprofit organizations. Applications are accepted from public agencies and individuals, but community organizations receive preference. Grants range from \$500 to \$2,500, with the majority between \$500 and \$1,000. Applications must be postmarked by December 31 for awards made the following year.

National Fish and Wildlife Foundation, 1120 Connecticut Ave. N.W. Suite 900, Washington, D.C. 20036; (202) 857-0162.

The National Fish and Wildlife Foundation (NFWF) is a nonprofit organization dedicated to the conservation of fish, wildlife, and plants and the habitats on which they depend. To further this goal, NFWF offers challenge grants in the form of federal funds which must be matched by private-sector funds raised by the applicant. Challenge grants are available in five categories: Conservation Education, Fisheries Conservation and Management, Neotropical Migratory Bird Conservation, Wetlands and Private Lands, and Wildlife and Habitat Management. Grant awards are decided on a project-by-project basis. Deadlines for proposals are July 15 and November 30.

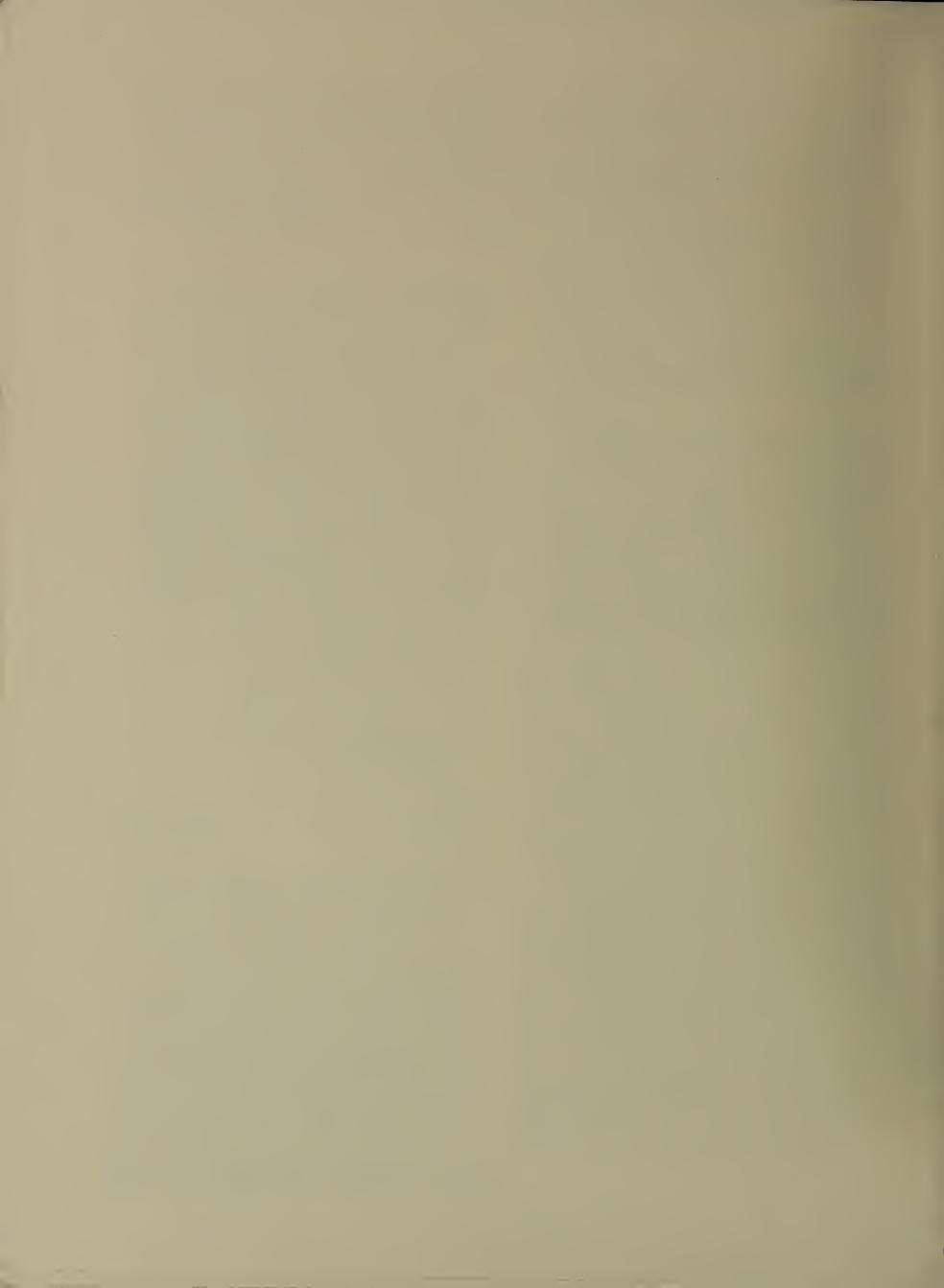
National Rivers Coalition, c/o American Rivers, 1025 Vermont Avenue, NW, Suite 720, Washington, DC 20005; ph: (202) 547-6900; fax: (202) 347-9240; e-mail: chadsmth@amrivers.org.

The National Rivers Coalition administers a seed grant program from donations made by Recreational Equipment, Inc. (REI). Grants from \$200 to \$1,000 are available to support direct grassroots lobbying to protect the nation's rivers and the public's access to them. The program does not support general education, scientific research, or water quality monitoring.

Funds can be used for project-specific expenses such as printing, mailing, travel, phone, and meetings, but not for salaries or for hiring consultants. Proposals must focus on one of the following six criteria: river recreation, lobbying for rivers, state river policies, hydropower reform, new strategies, and urban river restoration. Call for more specific information. Deadlines for application are June 1, August 20, and November 20.

World Wildlife Fund Innovation Grants, c/o The Sonoran Institute, 6842 East Tanque Verde Road, Suite D, Tucson, AZ 85715; (602) 290-0828.

Innovation Grants seek to spark creativity and action in natural resource protection by giving communities an opportunity to experiment with new approaches. They provide seed money to local, regional, and statewide non-profit organizations to help implement innovative strategies for the conservation of nature and for reconciling resource protection with sustainable development. Program focus and evaluation criteria may change from year to year, and award selection is also based on providing diversity in geographic location and range of techniques employed. Grants average between \$6,000 and \$7,000, with a maximum award of \$8,000. Applications must be postmarked by July 1 for awards announced in October.



APPENDIX J

Landowner Liability: A Guide for Massachusetts Landowners and Trail Groups

Goodwill and cooperation between private landowners and trail groups is a vital link in the development and continued existence of long-distance trails. Although most trail groups attempt to take advantage of natural areas under public ownership, inevitably a trail of any substantial length will have to cross private land. In negotiating with landowners for permission, licenses, or easements to cross private land, a number of questions and concerns commonly arise. The Massachusetts Department of Environmental Management (DEM) has prepared this document to address some of the relations between trail users and landowners. This information is intended to be general in nature, and specific cases may require further legal counsel.

Q: If LANDOWNERS ALLOW ACCESS
ACROSS THEIR PROPERTY, WILL THEY BECOME
EXPOSED TO LIABILITY SUITS FOR INJURIES
SUFFERED ON THEIR PROPERTY?

A: Trail users can sue a landowner but liability is limited by law to circumstances of unlawful, wanton, and reckless conduct. The standard definition for this willful conduct is: an intentional act or failure to act with knowledge (or knowledge of facts that would lead a reasonable person to know) that such conduct not only creates unreasonable risk of bodily harm to another, but also involves a high degree of probability that substantial harm will result.

Massachusetts General Laws (MGL) Chapter 21, Section 17C, as amended by Chapter 268 of the Acts of 1998, which limits a landowner's vulnerability to suits by reducing the duty of care, reads as follows:

17C. (a) Any person having an interest in land including the structures, buildings, and equipment attached to the land, including without limitation, wetlands, rivers, streams, ponds, lakes, and other bodies of water, who lawfully permits the public to use such land for recreational, conservation, scientific, educational, environmental, ecological, research, religious, or charitable purposes without imposing a charge or fee therefor, or who leases such land for said purposes to the commonwealth or any political subdivision therefor or to any nonprofit corporation, trust, or association, shall not be liable for personal injuries or property damage sustained by such members of the public, including without

limitation a minor, while on said land in the absence of wilful, wanton, or reckless conduct by such person. Such permission shall not confer upon any member of the public using said land, including without limitation a minor, the status of an invitee or licensee to whom any duty would be owed by said person.

(b) The liability of any person who imposes a charge or a fee for the use of his land by the public for the purposes described in subsection (a) shall not be limited by any provision of this section. The term "person" as used in this section shall be deemed to include the person having an interest in the land, his agent, manager, or licensee and shall include without limitation, any governmental body, agency or instrumentality, nonprofit corporation, trust or association, and any director, officer, trustee, member, employee, or agent thereof. A contribution or other voluntary payment not required to be made to use such land shall not be considered a charge or fee within the meaning of his section.

Any landowner with a hazard such as an open pit or unsafe structure on his or her property should repair or remove it. Whether or not a trail exists on the property, an owner could be liable for injuries sustained by a legitimate user or even by a trespasser, particularly if the injured party is a minor.

Q: If a Landowner grants access through permission or license, will this lead to permanent access? Would continued use lead to loss of control or to a permanent easement through adverse possession?

A: Continuous use of private property under permission or license from the property owner does not ripen into an easement. See MGL Chapter 187, Section 2. If permission is given for trail use, then that use is not adverse to the rights of the owner and cannot lead to claims of adverse possession.

Q: How can a Landowner Control what happens on the trail that he or she has allowed to cross the property?

A: The landowner may, and should, propose conditions of use to the trail organization. These conditions can be written into the license agreement or the easement. The owner or trail group might also want to erect signs reminding users that they are on private land and should refrain from certain proscribed activities. Examples of traditional restrictions prohibit lighting fires, camping, leaving trash, operating motorized vehicles, or gaining access after sunset. A farmer might want to stipulate that no produce be picked or that dogs must be leashed. These signs can be designed to meet the concerns of the landowner.

Q: WHAT IS A TRAIL EASEMENT?

A: In Massachusetts, the instrument for legal access for trails is called a "conservation easement" or more strictly, a "conservation restriction." These are legally enforceable agreements between a landowner and a trail organization or local or state agency (MGL Chapter 184, Sections 31-33), by which the owner of open land promises to preserve its natural state and keep it substantially free of future development. For trail purposes, such an agreement should include language stipulating public access for trail use. Such a restriction constitutes an "interest in land" that runs with the land and is binding on future owners. The trail corridor remains the property of the owner and can be sold or disposed of, but the trail easement is in perpetuity.

The agreement to preserve the land and to allow trail access can be donated or sold for its appraised value to a trail group, town, or public agency. Donations of land or conservation restrictions are tax deductible in most instances, with the amount of the deduction depending on the individual circumstances of the owner.

Conservation restrictions are the best tool for permanent trail protection, short of outright acquisition of the property by a nonprofit or government agency. They are permanent and appear on the title of the property. They also can provide a useful tool for landowners who are eager to preserve the natural quality of their open land.

Q: What other financial incentives are available for landowners who allow public trail access?

A: Owners who sell or donate conservation restrictions may apply for abatements in property tax assessments to reflect the reduction of value of their property after foregoing the development rights.

MGL Chapter 61B provides local property tax abatement for owners who open up their land for public recreation without charging a fee. This is administered through town tax assessments.

Q: WHAT IS A LICENSE?

A: Unlike an easement, a license is a revocable agreement between an owner and a trail group that permits trail access. It is a useful tool and superior to verbal and written permission in that it can be used to stipulate conditions of use and management agreements. Model formats are available from DEM's Trail Program.

Q: WHO IS RESPONSIBLE FOR MAINTAINING THE TRAIL ON PRIVATE LAND?

A: The trail organization or whoever accepted the easement or license is responsible for the care of the trail, in cooperation with the landowner. The trail organization should lay out, cut, and blaze the trail to specified standards. The landowner should always be consulted concerning major modifications, such as cutting large trees, opening stone walls or fences, or building bridges. Routine maintenance and clean-up are the responsibilities of the trail group. It is a

courtesy to notify the landowner prior to embarking on any trail work.

Q: Whom can the Landowner contact if there is inappropriate use or other problems with the trail?

A: A local trail representative from the trail maintenance group should be identified and should be available to owners to assist with problems.

Troubleshooting and quick response to landowners' concerns will help prevent loss of access.

Q: IF LANDOWNERS OPEN THEIR LAND FOR A FOOT TRAIL, HOW CAN THEY PREVENT UNAUTHORIZED MOTORIZED USE?

A: If the license or easement stipulates foot travel only, this should appear on signs at the entrance to the property. There are penalties for operating motorized vehicles on private land, and landowners and trail groups can work together by informing local police of violations. MGL Chapter 266, Section 121A makes it an offense punishable by a fine of \$250 to enter onto private land with a motorized vehicle or powered device, whether or not posted against trespass.

Q: If A TRAIL GROUP WISHES TO ESTABLISH A TRAIL ON PUBLIC LAND, DOES IT NEED PERMISSION?

A: Yes, permission is needed from the local park or forest supervisor prior to cutting a trail in a state park or forest. Trail use can sometimes conflict with other management goals such as forest or wildlife management or protection of water supplies. The supervisor must be informed of the route of the trail and be consulted on major changes involving cutting of trees or construction of bridges. Public land managers should be treated with the same courtesy as private landowners.

For additional information on landowner liability, consult the two articles by Douglas A. Muir listed in Appendix A.





